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OBSERVATIONS ON ANAGALLIS ARVENSIS.

By Joseph Augustus Heintzelman.

That large portion of our present Materia Medica which is drawn from the vegetable kingdom, is composed chiefly of plants, which once bore a despised name, but the discovery of their merits has won for them a more honorable position. But who can doubt that plants are now growing, in field or forest, which as yet unknown, are not less worthy of regard than those we most value? And in a liberal, experimenting age like *this*, we may confidently hope that numerous discoveries will be made in this department, and we may expect that a hospitable hearing will be granted to one which *claims* to possess useful properties, though it bears so humble a name as *Chickweed*.

It is well known that a great obscurity yet prevails in relation to the nature and the existence of hydrophobia, a disease which is still doubted, and even denied by many distinguished gentlemen of the profession, and for which disease no infallible and reliable remedial agent has been found. Therefore I do not enter into discussion about it, but relate at once the particulars which have induced me to make this common and little esteemed plant the subject of a thesis, and at the same time to investigate its active constituents and peculiar principles.

About a year ago one of our city newspapers reprinted from an old journal of the Legislature of Pennsylvania, preserved in the State Library, of which the contents were published, as follows:

"*Dauphin County, Londonderry Township, February* 18[illegible]2.

Sir:—A medicine of the utmost importance to mankind, prepared from an

herb which has been found unquestionably efficacious as a cure for the bite of a mad dog, either in man or beast, has been known and used as such by the subscriber and his ancestors in Germany and Pennsylvania.

The herb and manner of preparation has been cunningly obtained from me and prostituted for the purpose of accumulating wealth, contrary to my wishes or practice, and of those from whom it was derived; and being far advanced in years, I am desirous to communicate it in such a manner as may give the most general information to my fellow men, without the most distant view of emolument.

I have therefore thought proper to address these few lines to you, in full confidence that you will take a more effectual way to diffuse the information than from my age and other circumstances is in my power.

At your request, communicated by my friend Henry Orth, (health permitting,) I will attend in Lancaster, and explain the subject fully.

I remain your friend,

VALENTINE KITTERING.

To the Speaker of the Senate."

This letter was addressed to the Senate of Pennsylvania, and that body referred it to a committee consisting of Messrs. Parson, Porter and Lower, which committee was entrusted to consider it, and reported upon it, as follows:

"The committee appointed to hear the communication of Valentine Kittering, relative to his cure of the bite of a mad animal, report:

That they conferred with the said Kittering on that subject, who informed them that he uses the herb called Chickweed, which, when ripe or in full bloom, he gathers and dries in the shade, reduces it to a powder, and gives a small tablespoonful at one time to a grown person in beer or water, in weight of one drachm and one scruple, for a child an equal dose, but given at three different times, or it may be eaten on bread with butter, honey or molasses, as the person chooses. For a beast, a large spoonful; if by weight, two drachms and one scruple. When used green for a beast, cut the herb fine and mix it with bran, &c. When given to swine, mix the powdered herb with meal of any kind (dose as above) in little balls.

He assures us he has given it to persons many weeks after they were bitten, and never knew it to fail, and never gives more than a single dose, except to children as above. He further says, it is an excellent cure for [illegible] and wounds on the human body. When green, wash it, drop the juice in the wound, and bind the herb, so mashed, over. The proper time to sow the seed is about the beginning of April, and should be sown thin. He also informs us that he is now seventy-five years old, was born in Germany, and came from thence with his parents to Pennsylvania when eleven years of age, that his mother brought the seed of the herb amongst her garden seed, that he has presented to your committee, for the use of the

members, a quantity of the herb and seed, and says he will give of the seeds to others who will please to call on him for that purpose.

They also learn from the Reverend Muhlenberg, of Lancaster, that it is an annual plant, known in Switzerland and Germany by the name of Gauchheil, Hühnerdarm, Yernumftskraut, by the botanist (as he is informed) as Anagallis arvensis, and that it should be gathered when in full blossom. In Germany, he understands, the usual dose was 30 grains of the powder, taken four times a day, and continued one week in smaller doses; the wound washed with a decoction of the herb, and some of the powder stewed in it.

The committee therefore offered a resolution:

Resolved, That the Speaker be requested to present the thanks of the Senate to Valentine Kittering for his benevolent and valuable communication."

The allusion to the "remedy for the bite of a mad dog," has brought out, since the above communication, a copy of one of the original recipes, sold by Doctor Stoy, a son of the original discoverer. By request of the party who held the original it was published as follows:

"*Dr. Stoy's infallible Cure for the bite of a mad dog.*

"Take one ounce of Chickweed, and put it into a clean earthen pot and pour on it a quart of beer; place the pot over a gentle coal fire, and boil it until it is reduced to half, strain it hot from the pot through a clean linen cloth into a pewter dish, and then, while still hot in the dish, add one ounce of theriac and stir it well, until it is thoroughly mixed. Give a patient a dose, lukewarm, in the morning, the patient being duly sober, that is to say, without having taken anything in the morning; after this he must fast at least three hours, and during that time drink no cold water, and must take great care not to eat any pork and everything which has any connection with pork; for fourteen days he must not partake of any animal food, not even of the fish kennel. This is the dose for a grown person. To children of twelve years give the half, and so in proportion of age. To animals give the double portion given to a grown person, and in proportion with the water as above mentioned to be observed. As an application to wounds, the plant is cut while in blossom and then fried in fresh butter without salt, and then put on the wound three times a day by rubbing the scab off with an oak chip."

ANAGALLIS.

Sexual System: Pentandria Monogynia, (Linnæus).

Natural Order: Primulaceæ, (Lindley).

Generic Character: Calyx; quinquified, regular and perma-

nent. Stamina; proceeding from the reed. Corolla; funnel-shaped and slit. Seeds; numerous and scutiform. Petals; opposite and scattered.

Anagallis arvensis.—The Chickweed is an annual herbaceous plant, growing throughout Europe, Middle Asia and North America; it also grows abundantly near our own city, Philadelphia, at the fields and grave-yards, and is gathered during the time of flowering. It affords a remarkable instance of the sleep of plants, for at night the leaves approach in pairs and enclose the tender rudiments of the young shoots. The stem is first erect, but afterwards bent downwards, with branches attached from below, possessing an alternate line of hairs between each pair of leaves; the leaves are opposite, short, cuspidate, three-nerved and pale green, when dry. The flowers are axillary and on long erect stems. The odor of Chickweed is grass-like, the taste first flat and herbaceous, but afterwards bitter and slightly acrid; it yields its virtue to boiling water and diluted alcohol.

Chemical Constituents.

Gum, Albumen, Sugar, Chlorophylle, a crystalline matter, fixed Oil, pure Resin, and volatile Oil.

1. An infusion of Chickweed was treated with a solution of subacetate of lead, which caused a precipitate, indicating the presence of gum.

2. A portion of the fresh herb was beaten into a pulp and the fluid separated by filtering. This liquid was precipitated with bichloride of mercury and ferrocyanide of potassium; when heated, a coagulum was produced, showing the presence of albumen.

3. No indication of starch by the addition of iodine to a filtered decoction.

4. An infusion, exposed to air, readily underwent the vinous fermentation, which indicates the presence of sugar.

5. No tannic or gallic acid detected, having carefully added the tests of the salts of iron.

6. Muriatic acid was added to a strong alcoholic and ethereal extract, from which, when treated with water, a greenish precipitate was thrown down.

7. I tried various ways to ascertain the presence of an alka-

loid, but after many experiments I observed nothing which would indicate the existence of such a principle. The fact is, that after many trials, I separated a mass composed of very fine and needle-shaped crystals; but whether they are a crystalline principle, or are the result of the complexity of the reaction from the employment of the different tests and reagents, it remains a question which I cannot determine at present. The mode of obtaining these crystals is as follows: The fresh herb was macerated with alcohol, acidulated with sulphuric acid, displaced, and the resulting tincture filtered and treated with lime, until it evinced an alkaline reaction. The liquor was again filtered and treated with sulphuric acid in excess, filtered and concentrated by evaporation. To the residue a little water was added, and the liquor evaporated until all the alcohol was driven off, again filtered, the filtered liquor saturated with carb. potassa, agitated with successive portions of ether and evaporated spontaneously, when a crystalline mass was formed, which was purified by washing with successive portions of water.

8. A portion of the herb was displaced with ether, the resulting tincture spontaneously evaporated, which afforded a greasy extract, indicating the presence of fixed oil.

9. To an alcoholic extract freed from chlorophylle, I added liquor ammonia, then muriatic acid, and agitated the whole. Now, on adding ether, a separation took place, dividing the liquid in two layers, the upper holding the resin in solution, which was removed and evaporated spontaneously in a watch-glass. Dissolving the residue left after evaporation in a small quantity of ether, I pour it into a vial, and after evaporation the pure resin was left.

10. My last and most satisfactory experiment resulted in the production of a small quantity of volatile oil, the product of a large quantity of Chickweed (3 lbs. Troy of the dried herb), obtained by distillation of different portions of the herb. I have preserved this oil for the use of the "College Cabinet," and also a portion of the distilled water, impregnated with the peculiar odor and flavor of the plant. The odor of the oil is strong and perceptible, like that of cages in which birds are fed with Chickweed. It has a pungent and somewhat acrid taste, lighter than water, sp. gravity being 0·987. It is soluble in alcohol,

but less in ether; it is inflammable, burning with a bright flame, diffusing its strong peculiar odor.

It is very poisonous, four drops having caused intense headache and nausea, which lasted twenty-four hours, accompanied, during the whole time, by pains throughout the nervous system.

Physiological and Therapeutical Properties.

That Chickweed really possesses effectual properties, the information of *Orfila* gives us sufficient proof; that having administered three drachms of the extract to a big and strong dog, it died from the poisonous effects in the course of twenty-four hours. Another account from *Grognier*, (Compt. Rendus des Traveaux de la Societé de Médicine de Lyon, annéé 1810), which states, that a strong infusion of Chickweed given to stout horses always produced a trembling of the muscles of the back and throat, and that he observed a copious discharge of urine, and that he found, after the death of those horses, the mucous membrane of the stomach inflamed. I had but one occasion to observe the peculiar effect of the plant, and, indeed, on myself. I have repeatedly sought for an active crystallizable principle, but in vain, and I am satisfied that the active properties of Chickweed depends on its volatile oil. Of this I took freely four drops, which, after the expiration of a few hours, produced a severe headache; at the same time I experienced its poisonous effects throughout my whole body, and was sick from this cause a whole day and night.

In former times Chickweed was known and used as a panacea, and so much so as to attribute miraculous power against hydrophobia. Again we learn from accounts given by *Bischoff* and *Magellan*, that Chickweed had for a long time a famous reputation as an excellent remedy for jaundice, amenorrhœa, gout, palsy, and epilepsia, and has been employed and administered both internally and externally for the cure of cancerous and malignant ulcers.

Whether it deserves such a reputation, or whether these are fictions and hyperphysical pretensions which contributed to its expulsion from the list of the Materia Medica, and caused it to

fall into oblivion, I do not know. Yet if so, it is only what happens every day with other remedies. But if it be not a remedy for this disease, which is pronounced incurable, other experiments made on less dangerous maladies may prove it to be possessed of greater usefulness.

Chickweed produces in *small doses* (say one to two drachms, in the form of powder) profuse perspiration, soothes pain, &c., but in *large doses* it produces all the effects of a narcotic poison upon the frame and nervous system.

ON THE PROPER MENSTRUUM FOR FLUID EXTRACTS.

By John M. Maisch.

Many fluid extracts have been made by manufacturers and pharmaceutists, for which no formula has been published; at the same time there appears to exist a general desire for a considerable increase of the number of the officinal preparations of this class. The want of formulæ and of observations on the mode of preparing, the manner of keeping and the stability of many which are occasionally used or may be desirable, will have to be supplied by somebody, as the revision of the Pharmacopœia progresses, while a knowledge of the experience with these liquids in the laboratory and behind the dispensing counter would vastly aid the labors of the revising committee. I consider it the duty of every pharmaceutist who may be able to contribute a mite to our knowledge of the preparations in question, to do this at as early a date as possible, in order to assist in making the directions in our next standard as unobjectionable as may be. The preservation of the pharmaceutical preparations is one of the most important points to be considered. In the Proceedings of the Amer. Pharm. Association for 1858, a paper by Mr. Thayer was published, treating on this subject, with regard to fluid extracts. Able as the treatise is, still I consider the points arrived at fallacious, because the starting point is in my opinion a wrong one. And this was the ground I took against Mr. Thayer's opinions in my paper published on page 113 of this

volume. At the same time, I stated my own views on the subject, giving my reasons in detail and striving to keep strictly within the bounds of scientific discussion. I spoke of Mr. Thayer's paper, and not of his fluid extracts, of which, to the best of my knowledge, I have not seen a single specimen. The observations and experiments cited in my paper were made with preparations of my own make, not upon the large scale, but in such quantities as are generally required in the retail business.

It is my opinion, and I believe I have clearly stated it, that it is necessary to employ for the solvent an agent suitable to the chemical constitution of the various vegetables, not that one solvent should be made to answer in all cases. The proposition of using a saccharine fluid as a preservative, is not shaken by the admission of alcohol in cases where sugar and water are insufficient as a solvent. We may even be compelled to dispense with sugar altogether, using alcohol of the officinal strength, or diluted, if the preparation is intended for external use; such instances are the fluid extract of arnica, and of savine, as proposed by Prof. Grahame for the preparation of savine ointment. Recollecting all this, while I advocated the preference of a saccharine to a purely alcoholic menstruum, I did not think it advisable to undertake to recommend a way for preserving fluid extracts which would answer for every case.

It must certainly be our aim to make these preparations perfect solutions of all that is medicinally valuable, but not of all alcoholic or hydro-alcoholic principles, of which doubtless there are as many valueless, as of those soluble in water. This is not a new theory, the Pharmacopœia recognizes it, and as far as I know, no fault has been found on that account with preparations like Syrupus Ipecacuanhæ, Senegæ, Sarsaparillæ comp., Scillæ comp. Where the precipitate occasioned by evaporation has medicinal properties, nobody would think of separating it.

An objection to the use of sugar is its fermentativeness. Under the influence of ferment, sugar is converted into alcohol and carbonic acid without requiring any addition to the elements it already contains. Ferment merely acts by its presence, being itself in a state of decomposition; but does this decomposition go on independently of oxygen? It has been proven as far back as 1819, by Dumont, Dœbereiner and others that some

fruits are capable to undergo vinous fermentation in an atmosphere of carbonic acid, and according to Dœpping and Struve, grapes will ferment likewise in an atmosphere of hydrogen, without forming any yeast-cells. All these experiments have been made with fruits, which in their cells include, besides sugar and water, vegetable acids and bodies related to pectin. Now the transmutation of pectose by pectase into pectin and similar allied compounds, and the influence of vegetable cells which most likely have not been all torn by the expression which was performed in a space excluded from the air, are potent agents for the decomposition of organic matter, and probably of the utmost importance for this phenomenon. This sort of fermentation has no bearing on the case of our fluid extracts. Let us see what Liebig observes in regard to exciting fermentation in solutions. In his "Agricultural Chemistry," translated by Dr. Playfair, Philadelphia edition, page 96, he states that "neither the soluble nor the insoluble part of ferment causes fermentation," and then continues: "Before it (the soluble part) obtains this power, the decanted infusion must be allowed to cool in contact with the air, and to remain some time exposed to its action. . . . Yeast produces fermentation in consequence of the progressive decomposition which it suffers from the action of air and water." And in another place it is stated, that "its action is arrested by the temperature of boiling water, by alcohol, common salt, an excess of sugar, oxide of mercury, corrosive sublimate, pyroligneous acid, sulphurous acid, nitrate of silver, volatile oils and in short by all antiseptic substances."

Having on page 119 of this Journal spoken of the density of saccharine fluid extracts, the subsequent remarks appear to have been misunderstood. The idea intended to be conveyed, is that the liability of saccharine liquids to fermentation is not increased in the proportion of the increase of ferment, inasmuch as a small quantity of ferment is able to convert a large amount of sugar into alcohol, (1·5 parts dry yeast to 100 parts crystallized sugar, Thénard;) this liability is in a higher degree dependent on the density of the solution, and the higher we make the specific gravity of our fluid extracts, the nearer they approach to solidity, the less will be their proneness to fermentation.

The experiments with saccharine and alcoholic solutions of iodide of iron do prove the fact that sugar is a better preserving agent against oxidation than alcohol; and were not cited for any other purpose. Mr. Thayer's example does not place the two liquids in like conditions, inasmuch as a pint of syrup is unable to dissolve one ounce of oil of lemon.

I am fully aware that the value of chemical and pharmaceutical investigations is not affected by the locality where they are originated. My views were formed in experimenting to conquer difficulties, they are based upon theory and experience, and therefore I think that I am not much to blame if I adhere to them, until the theoretical ground as well as the facts shall have been overthrown.

MISCELLANEOUS CHEMICAL OBSERVATIONS.

By Dr. John T. Plummer.

[The following letter received from our friend Dr. Plummer is so characteristic of his observing habit of mind, that, though not intended for publication, we feel best satisfied to make that disposition of it. The reaction with urine will be of interest to medical men. The blue coloration with guaiacum is produced by various substances, like gluten, arabin, and the gummy juices of fresh roots like the potato and carrot. Whether animal mucus has the same effect we do not know.—Editor.]

Richmond, Indiana, 5 mo. 23d, 1859.

Esteemed Friend,—Some time ago, after filtering out a large amount of what appeared to be mucus, from the urine of an adult patient, (perhaps 65 years of age,) and who was afflicted with a renal or cystic complaint, I applied to it a few drops of tincture of guaiacum, and obtained a rich *Prussian blue color*. That there might be no mistake in the case, I repeated the experiment day after day, under varying conditions, and always and with certainty obtained the same result. This, it may be recollected, is Schönbein's method of detecting the presence of ozone, (which he considers *active* oxygen) in mushrooms, the metallic oxide, &c. My application of the tincture in this case was for another purpose, and meeting with this unlooked for result, I placed it among my memoranda, thinking some day it might be of some pathological value. As it may be

sooner available in other hands, I leave the further disposition of this curious fact to thee.

Another interesting matter has recently occurred to me, in the case of Mettauer's solution, (the compound solution of aloes, for the preparation of which a formula is somewhere given in the American Journal of Pharmacy). Having obtained very satisfactory results from its medicinal use for years past, I prepared several gallons of it, 12 or 18 months ago; but this spring, I found the surface covered with a white mould of a somewhat saponaceous character, and the liquid beneath increased in bitterness, owing, perhaps, to the partial removal of the glycyrrhizine by the molecular action which generated the mouldiness. After decanting the solution, I found at the bottom of the vessel a copious blackish-brown deposit, of a coarse, curdly appearance, adhering to the vessel with sufficient firmness to admit of its being washed repeatedly with water, without being detached. The discolored water was wholly free from the bitterness of aloes, after the first rinsing of the deposit. And now for some enquiries:

1. What formed the mould? 2. What remained in solution? And 3d, What constituted the deposit? I ascertained only that acids caused effervescence with the mould, indicating, perhaps, the presence of some of the carbonate of soda of the preparation. Aloes was evidently held in the solution, judging from the taste and the cathartic action of the liquid. After washing the deposit, I rubbed some of it into a thin paste with water, on a white pill-tile, and then added an acid, but no effervescence following, I inferred that no carbonate of soda remained in the deposit. But instead of effervescence, I was surprised by the immediate appearance of a beautiful *carmine red*. A very thin film of the paste, with a drop of acid at one end of it, in a few moments became reddened all over, say to the extent of two inches. This was probably due to the vapor of the acid passing over it. A drop of strong mineral acid dissolved the paste where it fell, (immediately after the generation of the red color,) and only formed a ring of red at its margin as a *permanent* product. *Dilute* mineral acids reddened, but did not dissolve the paste. Acetic acid produced no change.

This deposit, when dried, is friable and bitter like aloes, (though not to the same degree bitter) and of similar color and fracture.

Dissolved in water in a test tube, and nitric acid added to the solution, it yields a red precipitate and leaves a yellowish-brown supernatant fluid. The paste alluded to is of this color (yellowish-brown). What is worthy of note, also, is, that after the carmine color thus produced on the tile is dried and then moistened with water or alcohol, it loses its redness and resumes its original color.

Rubbed up with alcohol, the deposit is found to yield a yellowish-amber colored tincture, which, when the alcohol is evaporated, becomes a gamboge-yellow; and has a perceptible bitterness, and at the time of the solution, a bulky, olive green precipitate is left. This olive-green sediment, reacting with nitric acid, becomes snuff-brown. But the material, whatever it is, which plays such a curious part, is found in the tincture; for when this is evaporated, and the gamboge color obtained, nitric acid added to it produces the carmine color, which is rendered yellow again by wetting it with alcohol or water. The carmine color is similarly affected by solution of potash, and after this addition of the alkali, if sulphate of copper in solution be added, an instant bulky precipitate, exactly resembling Scheele's green in color, is formed. This may be of some importance in a toxicological point of view.

I send herewith some of the deposit in question.

In haste, thy friend, JNO. T. PLUMMER.

P. S.—I must take this opportunity of calling attention to some obvious errors, (three or four) in Flandin's formula for the detection of morphia, as given in Wharton & Stillé's "Medical Jurisprudence." Not having the book at hand, just now, I can only say I recollect the language, is "evaporate by alcohol," the *by* should be omitted. The proportions of materials in another place are transposed, and *alcohol* is designated in one place instead of *ether*, &c. Young, inexperienced chemists or physicians may be misled by the formula as it now stands.

NOTE.—[In relation to Mettauer's solution, the observations possess considerable interest. This solution is composed and prepared as follows:

Socotrine Aloes, in powder, -	2½ ounces, Troy.
Bicarbonate of Soda, - -	6 " "
Compound spirit of Lavender, -	2 fluid ounces.
Water, - - - -	4 pints.

Macerate for two weeks and filter.

The solution thus obtained is at first light reddish-brown, but becomes as dark as laudanum by age and exposure to light. Of the precise conditions concerned in producing the changes in Dr. Plummer's specimen we are not aware. Like all solutions of vegetable matter, containing but a trace of alcohol as in this case, Mettauer's solution is liable to cryptogamic growths from germs derived from the atmosphere, especially as much extractive matter exists, but the most singular part of the matter is the yellow constituent of the sediment. After repeating the experiment of Dr. Plummer, and being satisfied that his observations were correct, we exhausted a part of the dark brown sediment sent to us in the letter, with alcohol ·835 sp. gr., and allowed it to evaporate spontaneously. As the tincture concentrated, a deposition of crystalline matter occurred in crusts; its crystalline character is easily distinguishable by a common lens, but not the form. The color of these crusts, when dry, is deep gamboge-colored. When, however, an alcoholic solution is suffered to evaporate rapidly on a surface the color is bright yellow. The alcoholic solution has a somewhat bitter taste; when added to water, if concentrated, it forms a bright yellow, cloudy liquid. Nitric acid added to this produces the red color, but this characteristic is best observed by dropping a drop on a watch glass and spreading it over the surface, and adding a drop of weak nitric acid, when instantly the beautiful carmine red is developed. This substance is neutral, is not colored red by alkalies like crysophanic or cryssammic acids, is soluble in ether, but much less so than in alcohol, and its ethereal solution is rendered rose-colored by a drop of nitric acid; water extracts it from ether by agitation. It is insoluble in oil of turpentine. When this substance is exposed on a piece of foil to a red heat, it puffs up and affords a voluminous charcoal: and on burning out the carbon, a gray alkaline ash results in sufficient quantity to render it probable that the yellow substance is a soda compound of an organic body, (possibly an acid,) which in its free state has the red color. The fact, however, that only strong acids develop this color seems opposed to this view. It is well understood that carbonated alkalies dissolve aloin, and that the solution in contact with the air undergoes a rapid change, becoming darker, owing to oxidation. (See Stenhouse, vol. 23, p. 257, of this Journal.) It is probable, therefore, that we should look to this reaction long continued as the source of the yellow substance observed by Dr. Plummer. We have examined a deposit found in Mettauer's solution two months old, without finding any indication of this substance. We hope Dr. Plummer will resume the subject with his more abundant material, and his knowledge of all the circumstances, and give us his results in a future communication. As regards the errors in Wharton and Stillé, those of our readers who have the book should note them, and we doubt not the publisher will correct the next edition.—EDITOR AMER. JOUR. PHARM.]

NOTES ON THE FLUID EXTRACTS OF BUCHU, CIMICIFUGA, SERPENTARIA, AND VALERIAN.

By John M. Maisch.

Philadelphia, June 3d, 1859.

To the Editor of the American Journal of Pharmacy:

Dear Sir,—In compliance with your desire, I herewith send you the formulæ for those fluid extracts, specimens of which I some time ago handed to you for inspection; they comprise extracts which generally used to be preserved by alcohol or diluted alcohol. In consonance with my views on the proper menstruum for fluid extracts, as published in the March number of the American Journal of Pharmacy, I have endeavored to make them containing as much sugar as possible, and add just enough alcohol to help to keep the resinous principle in perfect solution.

In making these fluid extracts and other preparations, I have made experiments, in accordance with Professor Grahame's rules for displacement, and have become a convert to his views and to the applicability of his manipulations to all cases where the immediate object is to obtain a concentrated tincture with as little menstruum and in as short a time as possible. But to reduce a larger quantity of crude material to such a state of fineness as to pass through a sieve of 50 to 60 meshes to the linear inch, is attended with considerable trouble, and, as I thought, more than is necessary for preparations which require to be evaporated, particularly if with the application of heat. His directions will impose a vast amount of manual labor on the pharmaceutist, without, the above instances excepted, adequately recompensing him therefore. For that reason I have varied from his directions by passing roots and other drugs, which are comparatively easy to pulverize, successively through the drug mill, or treated them in the mortar until all the raw material would pass through a sieve of 18 meshes to the inch; from this coarse powder I sifted off all that would pass through a fine sieve of 50 meshes, moistened both parts separately, in accordance with Mr. Grahame's directions, packing them afterwards, the finest powder below, in a proper manner in the percolator, and covering the top with filtering paper. I have generally left it in this condition, with

the gradual addition of a very small quantity of menstruum, from 2 to 4 oz. to 16 oz. material, for an hour or two, to enable the coarser particles to absorb thoroughly the liquid with which they had been moistened; liquor was then poured upon the filtering paper and the percolation allowed to proceed.

Buchu leaves, on account of their tenacity, are hard to pulverize; exposure to heat and subsequent powdering in a cool mortar would greatly facilitate it, but is inadmissible on account of the loss of the volatile principle. By some labor with the mill and the mortar I succeeded in getting them fine enough to pass nearly all, without any pressure, through a sieve of 12 meshes to the inch; the remainder, about one-eighth or less, was not farther pulverized; the percolator was packed as before, and displacement commenced as soon as the coarse powder had fairly began to swell up.

I think it will be necessary, advisable at least, to state in the next Pharmacopœia the degree of fineness of the powder to be used in the displacement process; so as to induce pharmaceutists to perform this labor themselves, instead of buying the powder; the officinal directions must not be made unnecessarily laborious. As the material on top of the percolator is exhausted first, it is advisable to assign this place to the coarsest of the powder.

After these general explanations I proceed to give you the formulæ which I employed:

Extractum Buchu fluidum.—16 ounces of buchu leaves are percolated with a mixture of 6 fl. oz. of ether and 12 fl. oz. alcohol, to be displaced until 18 fl. oz. are obtained, which tincture is evaporated spontaneously to 3 fl. oz.; the precipitated chlorophylle is dissolved in 3 fl. oz. alcohol, and both liquids are mixed with 12 oz. sugar; meanwhile the residue in the percolator is exhausted with diluted alcohol, (about 12 oz. will be sufficient,) the tincture evaporated to 4 fl. oz. added to the sugar, which is dissolved by a moderate heat and the extract strained.

Extractum Cimicifugæ fluidum.—16 oz. of the root are extracted with a mixture of 8 fl. oz. ether and 1 pint of alcohol, and left to evaporate to 2 fl. oz., which are dissolved in 6 fl. oz. of alcohol; 8 oz. of sugar are made to absorb the solution. The residue of the root is exhausted by diluted alcohol, the resulting

tincture evaporated to 6 fl. oz. intimately mixed with the sugar and evaporated in a waterbath to one pint.

Extractum Serpentariæ fluidum.—16 oz. of the root are extracted with one pint of 95 per cent. alcohol, the tincture allowed to evaporate to the consistence of a thin extract, which is taken up by 4 oz. 95 per cent. alcohol and intimately mixed with 12 oz. sugar. The residuary root is exhausted by diluted alcohol, evaporated to 8 fl. oz. added to the sugar, which is dissolved by a moderate heat, and the extract is then evaporated to one pint.

Extractum Valerianæ fluidum.—16 oz. of the root are displaced with half a pint of ether and 1 pint of 95 per cent. alcohol, the tincture allowed to evaporate to 8 fl. oz., the clear liquid is incorporated with 10 oz. of sugar, the precipitated resin is dissolved in 3 fl. oz. of 95 per cent. alcohol and added to the sugar. The root is then exhausted with diluted alcohol, the tincture evaporated to a syrupy consistence and added to the sugar, which is to be dissolved by the aid of a waterbath ; the resulting fluid extract is evaporated to one pint.

To these directions allow me to add a few comments:

Though three of the above articles contain a certain amount of volatile oil, I think the first alcoholic or ethereo-alcoholic tincture may be safely evaporated at a moderate heat of about 160° F., without any appreciable loss of volatile oil. The volatile principle of black snakeroot, a member of the family of Ranunculaceæ, is probably of a nature similar to the volatile acrid principles found in the roots of some other plants belonging to this important family, and which mostly are of such a delicate nature as to be easily modified or completely changed by the influence of air, so that it most likely will be found essential to prepare the fluid extract, not only from the recently dried root, but also to hasten the first part of the process in order to bring this principle under the protecting agency of sugar.

With properly constructed apparatus, I am of opinion that exhaustion of the crude material with ether may be found preferable, as the ether allows of its evaporation being carried on at a very moderate temperature, and might be nearly all regained, while the resulting extract may be taken up by alcohol, which would leave any fixed oil and much of the chlorophylle behind,

if an alcohol of about sixty per cent. was chosen. Should the extract contain nothing of medicinal importance but a volatile oil, its incorporation with sugar and subsequent dissolving in water might be resorted to, so as to separate inert matter. The residuary material might then be exhausted with diluted alcohol or any other proper menstruum; the resulting tincture to be properly evaporated or distilled to regain the alcohol. Drugs containing volatile principles if treated in accordance with these suggestions, I am inclined to think, will yield fluid extracts containing all that is valuable and desirable to preserve. I have not had occasion to follow these hints practically, for which purpose I intend to employ some of the stronger odoriferous drugs.

The separation of chlorophylle from the fluid extract of buchu has occasioned me a good deal of trouble. The residue of the ethereo-alcoholic tincture is a liquid, and chlorophylle of a semi-fluid consistence, to which some odorous matter persistently adheres; to separate the latter, I threw the chlorophyll precipitate, mixed with some diluted alcohol, upon a moistened filter, in the hope of being able to wash it out; but the chlorophylle soon settled down, gradually displaced the moisture from the filter, and then slowly passed through. It was dissolved in alcohol, and after finishing the extract, and, while still warm, I pressed it through flannel and canton flannel, but the finely divided chlorophylle likewise passed mostly through, and as you will perceive in the specimen in your possession, has since separated cream-like to the surface, leaving the syrupy liquid beneath perfectly transparent. The addition of more alcohol would dissolve it, but as it has no medicinal value, I should consider this addition no improvement. I believe it more advisable to make more experiments in the direction pointed out above, with the ultimate view of separating it entirely.

In preparing fluid extract of matico, the separation of chlorophylle is attended with less difficulty, being readily separated by flannel, when it may be washed with a little diluted alcohol; it is much firmer than that obtained from buchu which is probably intimately associated with some waxy matter.

As you will perceive, the above fluid extracts have been made to contain in the fluid ounce the virtues of one ounce Troy of

the raw material, a standard I think properly to be adopted for all preparations of this class, the oleo-resins of course excepted, and which standard strength has met with the approval of our medical friends.

The specimen of fluid extract of arnica was made by me three years ago; being intended for external use, it could not be preserved by sugar, and alcohol had to be resorted to. To test its preserving qualities, I filled the vial immediately after the extract was finished, and it has never been opened since, until it was placed in your hands, so that no evaporation could take place; notwithstanding this, a precipitate is found adhering to the sides of the vial. The same experience, I think, has been made by every pharmaceutist with the officinal fluid extract of valerian. Mr. Grahame's fluid extract of savin and the fluid extract of ergot, as proposed by you, have the same tendency, but both in a degree much less than any other alcoholic fluid extract that I am acquainted with. On the other hand, I have a few fluid extracts on hand made by myself some two years ago, and preserved by the agency of sugar, without any addition of alcohol; they have been kept in well stopped vials, in a room where they have been under the influence of all changes of temperature during at least two summer and two winter seasons. I shall be happy to show them to you at my earliest opportunity, you will find them neither fermented nor the sugar crystallized; their appearance is still unobjectionable, but as I have not uncorked the vials for probably over a year, I cannot at present speak of their other sensible properties.

I remain, yours, very respectfully,

J. M. MAISCH.*

* NOTE BY THE EDITOR.—Some months ago, Mr. Maisch having presented us with samples of several fluid extracts, which appear to possess decided merit, so far as judged by their sensible properties, we requested to have notes of the formulæ used, and, though intended for private information in connection with some labor in the same direction for the Association, in justice to the writer we have, with his consent, printed the letter, so that others similarly engaged may avail themselves of the suggestions, if approved. Theoretically there seems to be too much alcohol to enable the sugar to be retained, yet in only the extract of buchu has any crystallization occurred; owing to the greater sp. gr. of the these syrupy extracts, the tendency of the separated oleo-resinous matter is to the surface; all

the extracts being clear below. Agitation easily reunites the super stratum with the clear extract.

We confess, however, that our experience is in favor of making valerian, buchu, cimicifuga and allied drugs, owing to their virtues to oleo-resinous principles, with an alcoholic menstruum, and with as little evaporation as possible. The views of Prof. Grahame, (see page 379,) in regard to fluid extract of valerian, appear to meet the case, and if by the aid of careful percolation we can get nine-tenths of the active matter of a drug in nine-tenths of the bulk of the fluid extract to be made, we believe the problem will be solved, so far as this class is concerned; but we must be careful that we do extract all that the physician needs in the preparation. There are cases where the solvent power of glycerin may come into play when the retention of alcohol in the fluid extract may prove objectionable. It is certainly very desirable that fluid extracts should be homogeneous solutions, and to this end let us strive to attain, if it be possible.

ON PERCOLATION OR DISPLACEMENT.

By William Procter, Jr.

It has long been conceded that the process of displacement or percolation, as developed by the Boullays of Paris in 1833, is calculated, in proper hands, to work a complete revolution in the manipulations of extraction, as applied to pharmacy. Those who have understood it have not failed to get results, which, if not entirely satisfactory, have so far exceeded the ancient methods of maceration and digestion, that they have won for it the preference. Why then, it has been asked, has not this process been universally employed? Why, in two successive revisions of the Pharmacopœia, has it been but partially adopted, giving the preference to the old methods? I believe, the reason will be found in the fact that the practice of this process involves more preparatory labor and stricter attention to certain conditions, without which it is a failure, and that it was the want of confidence by the Pharmacopœial authorities in the ability and willingness of those who have in charge the business of pharmacy, faithfully to carry out these conditions, that caused percolation to be offered as an *alternative*, instead of being made the normal process of extraction. The very simplicity of maceration renders it easily understood by the novice, and any irregularity in the preparation of the materials is overcome in a great degree, by the longer time devoted to the process.

Unfortunately, many persons who employ percolation habitually, do not understand its principles and details sufficiently clear to gain all the advantages it affords, or even to get products, in many cases, equal to those by the old methods. My attention has been reattracted to this subject, partly by the near approach of a new edition of our Pharmacopœia, and partly by the excellent paper of Prof. Grahame, read at the last meeting of the Association, at Washington, which has been reprinted on page 354 of the present number from the published Proceedings; and I propose first to consider what the displacement process was intended to accomplish, and the conditions to be attended to, and afterwards remark on the results of Prof. Grahame.

The object to be obtained in practice by Boullay's theory is this: a solvent, poured on the top of a powder consisting partially of soluble matter contained in a cylindrical vessel and supported on a porous diaphragm descends from layer to layer by capillary attraction, and its own gravity, exerting its solvent power on each successive layer until its power of solution is exhausted, after which it continues to descend by the pressure of the superincumbent fluid, until forced out through the diaphragm into the vessel below, a saturated solution; this process continuing until the soluble matter is so far removed from the powder that the liquid by the contact becomes less and less charged with the soluble matter until exhausted. But to gain this result it is absolutely necessary that the substance treated shall be in *a uniform powder*, and that the *capillarity or porousness of the mass of powder be not destroyed by any cause whatever*, for, *on the fact of the slow, regular, and even descent of the solvent, from one horizontal layer to the next* without side-channels or circuits, caused by irregular powdering or imperfect packing, depends the success of the process. Now what are the causes which interfere with this important condition? They are several:—1. The imperfect preparation of the powder owing to the difference of opinion as to the degree of fineness it should be made to assume, and to the careless dislike of the trouble it causes. To say that all substances should be equally fine would be incorrect, as in substances containing a large proportion of matter very soluble in the liquid used, the powder should not be quite so fine

as in examples where the proportion is less, for the reason that the proper capillary action is interfered with. To give an extreme example in illustration, it would not be proper or possible to displace finely powdered gum or sugar with water, or guaiac or mastic with alcohol; but by associating with these powders a a sufficient quantity of insoluble matter in powder, the condition of porosity being established, the process would go on. But the range of fineness should not be very great in small regular operations; and where the state of division is properly attended to there need be no difficulty in regulating the porosity of the mass and consequent passage of the liquid.

It is an excellent custom to keep a set of sieves for the preparation of powders for this purpose, so that the degree of fineness of powders for percolation can be easily regulated, and it will be a point worthy of consideration by the revising committee of the Pharmacopœia, whether some more definite directions as regards the state of division of drugs for displacement, cannot be given than at present,—Dr. Squibb suggests that a sieve of 24 meshes to the linear inch produces a powder of the right fineness,—Prof. Grahame considers the range should be from 40 to 60 meshes to the inch, I believe the range should be greater to include large and small operations, 20 to 60 meshes to the inch. Where the menstruum is ethereal or alcoholic (50 to 95 per cent. in strength,) the finer powder will be found very suitable, even in a cylindrical percolator, unless the powder is highly resinous, in which case, either the powder must be coarse, or if fine, must be admixed with an inert powder like sand to give the requisite porosity. When, however, very dilute alcohol or water is used, a powder 40 to the inch will be found fine enough, and if the substance is mucilaginous, 25 to 30 meshes will be found sufficient. But whatever degree of division is adopted let it be as uniform as possible, and not consist of fine cellular tissue mixed with long coarse fibres, the result of simple contusion as is often the case. Until apothecaries will conscientiously assume this trouble and care, they will not be able to derive the beautiful and satisfactory results from this process, which it so abundantly affords.

This brings us to the second stage of the process, viz., the manner of packing the material in the apparatus, as regards its

condition of dryness or moisture at the time it is packed, and the form of the apparatus used. Boullay almost invariably recommended the powders to be packed dry—others dampen the powder or even saturate it by previous maceration. Our Pharmacopœia, based on the experience of many operators, almost invariably directs the powders to be previously macerated in a portion of the solvent. My own practice has been in favor of macerating the powders in all cases where the menstruum is water or very weak alcohol, where the powders swell by absorption; whilst with alcohol or ether to proceed at once with the percolation, with or without previously moistening the powders at the time of packing, according to circumstances. Prof. Grahame invariably uses fine powders, and previously dampens them with menstruum, just sufficiently to facilitate (or invite, so to speak,) the entrance and descent of the fluid through the the powders without destroying their pulverulent condition and interfering with their regular packing.

The degree of pressure to be exerted in compacting the powders must vary with their nature; hard ligneous substances will require more compaction than such as tend to expand by contact with fluid. There is a class of drugs, of which rhubarb and columbo are a type, which become adhesive by contact with water or weak alcohol, and constantly give trouble to the operator in the ordinary cylinder, owing to their tendency to swell up and form an impervious mass. It will be seen by the sequel that the employment of a conical percolator in great measure remedies this difficulty. There is another class that contain incoluble gum or mucus analogous to bassorin, like senna and althæa root, which swells up and forms a gelatinous mass with water, wholly unfit for percolation in an ordinary percolator. With the conical displacer even these may be treated with an aqueous menstruum; but unless the mucilage is desirable in the preparation, as in syrup of althæa, it is better to use a partially alcoholic menstruum. In those cases where the swelling is due more to the expansion of the cellular tissue of the particles by contact with water than to mucilage, even though a large amount of soluble extractive matter be present, as in the case of gentian, it will be found advantageous to use a fine powder, 50 or 60 to the inch, moistened with

half its weight of water, which does not destroy its pulverulent condition, and treat it in a conical percolator. Prof. Grahame having met with no difficulty on the score of compaction by swelling, overlooks this fruitful source of trouble in direct displacement with the ordinary cylinder, owing to his having accidentally employed the funnel as a convenient percolator, and his success with those substances that ordinarily require previous maceration to swell them is largely attributable to this cause. When a damp vegetable powder is packed in the conical cavity of a funnel and covered with paper to avoid the derangement of its strata, and water is poured carefully on, the liquid is absorbed, the insoluble cellular structure of the particles becomes swollen, and the whole mass, stratum after stratum, expanding laterally and vertically, finds no difficulty in relieving itself, owing to the inclination of the sides; but in a cylinder the lateral expansion gaining no relief except vertically, the particles are compacted together often to such a degree as to prevent the percolation altogether. I believe that, philosophically speaking, the cylinder is the proper shape of a percolator in cases where expansion presents no difficulty, but where this occurs, the use of a cone, as employed by Prof. Grahame, has very important advantages.

Whatever form of apparatus is used, or however the packing may be affected, the operator should either by a disc of paper, muslin, or lint, or a layer ofsand, cover the surface of the ingredients so that the addition of fluid shall not disturb the stratification of the powders. Boullay employed an upper metallic diaphragm. If paper or muslin, etc., is used, it should be soaked in the liquid, and carefully pressed into its position so as to remove the air beneath before adding the menstruum, else it will be displaced by its buoyancy.

But the peculiar merit of Prof. Grahame's paper is, that it insists on the invariable production of a highly concentrated solution at first, (a result always attained most effectually by direct displacement,) which enables the operator to fraction his product, to make less menstruum suffice for exhaustion, and in cases requiring evaporation, shielding the principles from the injury of prolonged heating. He also can avail himself of it in making fluid extracts, by reserving the densest first liquid, eva-

porating only the weaker. This brings us to consider the subject of saturation in regard to pharmaceutical menstruua, and to explain how it is that a solution by direct displacement is necessarily more concentrated than one by displacement preceded by maceration or by simple maceration. By way of illustration, let us take krameria: 1. The strongest aqueous solution attainable by maceration is that obtained by saturating rhatany powder with water, letting it stand in a cool place for 24 or 48 hours and then expressing it. The largest proportion of material is thus brought in contact with the smallest proportion of solvent possible in this method, which we will assume to be a pound, (7000 grs.)in a pint.

2. If now, instead of pressing this rhatany, it be placed in a percolator properly packed, and treated with water, so as to displace the infusion very slowly, the first fluid ounce that passes will nearly represent the liquid by maceration. The *second* fluid ounce will be stronger by the amount of matter dissolved in its passage through the powder occupied by the first fluid ounce. The *third* fluid ounce will be yet denser, owing to its gathering up from the leaving of the first and second fluid ounces. And this goes on until the added menstruum begins to mix with the last portions, when the specific gravity of the mixture will be less than that of the infusion originally absorbed.

3. But when you operate by direct displacement, (or in the way proposed by Prof. Grahame, which amounts to nearly the same thing, and is more certain,) the first fluid ounce of liquid that enters the powder exerts its solvent power on *every successive layer of the powder*, until it ceases to dissolve any more, after which it is simply pushed downward by the gravity of the liquid above, minus the capillary attraction exerted (sponge-like) by the powder to retain it. The second fluid ounce proceeds in like manner to exert its solvent power till saturated and passed; and this process proceeds so long as the amount of soluble matter is sufficient to wholly satisfy the solvent action of the water during its contact, after which point the liquids will be found less and less dense. Now, on comparing the first portion of the liquid by direct displacement with the others, it will be found to be much stronger and more syrupy; and though

the last portion of the pint will be weaker than any of the others, yet when all the proceeds of the immediate displacement are mixed, the average will be stronger than either of the others.

In conclusion, I will offer the following experiments:

1. An ounce of gentian root was powdered and passed through a sieve 60 meshes to the inch, moistened with two fluid drachms of water so as to be yet pulverulent. It was put in a funnel, the neck of which was previously stopped with *moistened* cotton, slightly pressed and covered with filtering paper and the height in the funnel marked. Water was now poured on: the powder gradually absorbed its bulk, and a dark brown liquid collected in the vessel below. The densest liquid amounted to 3½ fluid ounces, but more than eight fluid ounces were required to exhaust it. The first liquid, by standing a few hours, gelatinized, from the large amount of pectin it contained. The surface of the powder, when exhausted, had risen half an inch in the funnel.

2. Two ounces of Alexandria senna, of similar fineness to the gentian, was moistened with half a fluid ounce of water, and arranged in a funnel as above. Water was poured on and was slowly absorbed, having required 8 hours to become saturated; a dark, nearly black, syrupy liquid gradually collected below, requiring 14 hours to four fluid ounces. This liquid was very highly charged with the properties of the senna and very odorous. The powder occupied twice its original bulk, and was gelatinous.

3. Two ounces of senna moistened and put in a lamp glass cylinder, refused the passage of the liquid after twenty-four hours, owing to its consistence.

4. Two ounces of rhubarb of similar fineness was moistened with half an ounce of water, (a difficult operation, owing to the tendency of the powder to form a paste by contact with water, and thus oppose its general distribution among the particles,) and treated precisely as the senna. The absorption took place with great slowness, about 14 hours elapsing before the liquid commenced to pass, and 20 hours longer were required to fill an 8 oz. vial. Of the infusion, about one-half was saturated, and above this the liquid was less dense, but quite strongly

impregnated with the color and taste of the root. When we consider the comparative insolubility of the *isolated* resinous and coloring principles of rhubarb, it is surprising how large a quantity may be extracted by the slow action of cold water in this way. I believe that for treatment with cold water, rhubarb should be in powder of at least 40 meshes, if not 30, so that it will be more porous.

5. Two ounces of powdered columbo was treated in the same mann r; the absorption was nearly as slow as in the rhubarb, about 10 hours elapsing before it commenced to pass out below, and 14 hours longer were required to fill an eight ounce vial. On examining the product it was found that the first three ounces were dense and dark colored, the liquid above being gradually less colored, but quite bitter. The mass did not swell as much as the gentian. The result would indicate the impropriety of so fine a powder for columbo, because of the slow passage of the menstruum, and its tendency to decompose in warm weather before the root is exhausted—even with the use of the funnel.

All of these substances with diluted alcohol, would have behaved much better and the results obtained more quickly, yet the experiments serve to illustrate the influence of a conical percolator.

ON THE MANUFACTURE OF THE OTTO OF ROSE AT KISANLIK IN EUROPEAN TURKEY.

By J. Lawrence Smith, M. D.

Professor of Chemistry in the University of Louisville.

Seeing an article in the May number of the Journal of Pharmacy on the Otto of Rose, brought to my recollections some neglected notes made during my residence in Turkey,* on the culture of the rose and the extraction of its oil at Kisanlik in the Balkan Mountains.

Having succeeded in finding those notes, and as they contain matter which may interest some of your readers, I forward them for publication.

* [Note.—Prof. Smith was engaged during two years in the geological survey of Turkey, under the patronage of the Sultan.—Editor.]

The region where the rose is cultivated is a valley in the Balkan Mountains, in which is situated the city of Kisanlik, about 60 miles north west of Adrianople, in latitude 42° 40′. It is only within fourteen or fifteen years that the cultivation of the rose has taken its present development in that region, although for a number of years the otto has been made there in limited quantity especially for royal presents. The surface of the country is that of an extensive plain, shut in by elevated ridges, and here the rose is cultivated by the farmers, who sell the roses to the distillers residing in Kisanlik, seldom or never distilling them on their farms.

The rose cultivated is of one kind, a full red rose, that was doubtless introduced into this region many years ago, and selected for its great fragrance and peculiar adaptation to the distillation of the oil. Its cultivation is attended with but little trouble. The bushes are allowed to grow from 4 to 6 feet high, although sometimes much higher.

The roses are gathered during the months of May and June, six weeks being the term usually occupied in getting in the crops.

The yield is on an average about 1¼ lbs. of rose leaves to a bush, the roses being collected with the calyx.

They are gathered half expanded, and at the dawn of day, and not unfrequently before daylight. They cannot be kept advantageously more than a day before being put into the still; if obliged to do so, they must be turned over frequently, as otherwise they will ferment, heat, and the otto be lost.

The roses are placed in copper stills of about 30 gallons' capacity, in proportion of 60 lbs. of rose leaves to 15 gallons of water, and the still immediately heated. The oil is in the first portion of the water which comes over; however, one half the water is distilled—this is collected in several large bottles; this water is now placed into a second still, and about one-fifth of it distilled, on which all the oil will float. The oil is taken off the surface with a little spoon and placed in an appropriate vessel. All the water distilled in both first and second operation is sent into market as rose water.

The water remaining in the still with the rose leaves is strained off and added to a fresh portion of leaves, in the proportion already mentioned.

The quantity of rose leaves required to produce one metical, (1½ drachms) of the oil, varies from 30 to 60 lbs., according to the nature of the weather. If the roses open during wet weather, and flower slowly, the yield is at its maximum; if, however, the weather is hot, and the bush flowers vigorously, the yield diminishes, the rose itself is paler, and if not picked at an early stage yields almost nothing.

There is a green wax that comes off the calyx, attaching itself to the fingers of those collecting, that also yields an oil by distillation.

The annual product of otto of rose in this region is from 28,000 to 33,000 ounces, although so largely is it adulterated that the amount of oil exported as rose oil is upwards of 70,000 ounces.

The material employed for adulteration is the oil of a species of geranium, very probably the *Pelargonium roseum*, grown in Arabia, in the neighborhood of Mecca,* and taken to Kisanlik, for the purpose of adulterating the otto of rose. This geranium oil has the odor of the rose mixed with that of the lemon.

In fact, it is a common thing, both in Europe and this country, to find this geranium oil in market, called otto of rose, sometimes mixed with a little spermaceti and benzoic acid.

On one occasion, a merchant at Constantinople, told me that he sent large quantities of oil of geranium to parties in New York, who informed him through his agents in Smyrna, that it sold very readily in this country as otto of rose, and that the difference was not appreciated.

It is almost impossible to obtain the oil of rose pure; the distiller hardly gets his oil together in the evening, before he commences to elongate it by a little geranium oil; if it be only five per cent. he must put that in. Such small addition as that would be made only by *very conscientious traders*. Fifty to two hundred per cent. are far more commonly added. And should the otto happen to sojourn a little while at Constantinople, it would increase still farther in weight and bulk. In the bazaars

* [Note.—The reader, by reference to page 336, will find this point satisfactorily settled by Mr. Hanbury, who shows that the so-called oil of geranium, though it does come to Turkey from Mecca, is really produced in Northern India, and carried to Mecca via Red Sea commerce.—Editor.]

of that city, three or four grades of the otto can be bought; of course, they are simply different degrees of adulteration.

The exact cost of manufacturing the pure otto of rose, at Kisanlik may be estimated by referring to the following figures of an actual experiment made under my direction:

10,000 lbs. fresh rose leaves . . .	$140.00
Paid for use of still	6.25
Paid for labor and fuel	16.50
	162.75

Yield was 36 ounces, thus costing $4.52 per ounce to the producer.

This fragrant oil is made in other parts of the world by processes differing doubtlessly from the one described, also from a different rose; the one used in Tripoli is white, having but few petals. The rose grown in the southern portion of France bordering on Italy yields hardly a trace of oil by distillation, although only ½ degree further north than Kisanlik, the rose leaves there being used directly to impart their odor to perfuming soaps or distilled water.

As regards the manner of testing the purity of the oil, I agree with Mr. Mackay, that the sulphuric acid and other tests are of no value. The odor is the best test, and that can only be applied by experts where the otto is made.

ON THE USE OF FUNNELS IN DISPLACEMENT.

By Edward Parrish.

Since the publication in the Proceedings of the American Pharmaceutical Association of the views and experience of my friend Prof. I. J. Grahame, on the management of the process of Displacement or Percolation, I have tried several experiments with a view to satisfy myself in regard to their utility or correctness. In these experiments I have attempted to obtain some of the most common preparations by following his directions carefully and accurately, and have met with repeated disappointment and in one or two instances lost considerable quantities of material by the apparatus becoming clogged, and the menstruum flowing

so slowly that in one case fermentation took place and the whole became worthless.

It will be recollected that according to the directions of Prof. Grahame all substances designed for displacement are to be powdered so as to pass through a sieve of 40 or 60 meshes to the linear inch, according to the permeability of the material; then moistened to such extent only as that, the pulverulent character being not entirely lost, the particles shall, when rubbed between the hands, move freely upon each other; then packed into the apparatus more or less firmly in proportion as the mass possesses this mobility, or is adhesive, and then the whole of the liquid being poured on to the top it is allowed to proceed to completion.

This process was so novel and contrary to my previous experience that I should not have given it a trial, but for the deservedly high reputation of its author, his positive assurances of its success, and the evidences he had long ago shown me of the superiority of his percolated preparations. One point in his experiments which had appeared of no importance to him, had attracted my attention as likely to increase the difficulties of the process, and I had accordingly omitted any attention to it in my manipulations; he had always used *a funnel* which he said was not objectionable, as generally supposed, and had the advantage of being always at hand, cheap and, when of glass, allowed an opportunity to inspect the uniformity of the packing and the gradual progress of the displacement. I had always objected to the use of the common funnel for any of the more difficult displacements, and had stated in the first edition of my work on pharmacy, that in treating rhubarb, senna, squill, &c., with any menstruum containing a considerable proportion of water, the displacer must be a cylinder with a broad and coarse diaphragm, and that a common funnel with a plug of cotton in the tube was quite out of the question.

Now, to an accidental trial of the *common funnel*, with a porous powder dampened and tightly packed, as directed by Grahame, I owe the discovery that I had all along been mistaken, and that the shape of the apparatus was perhaps the chief though the unsuspected cause of Grahame's success in percolation.

Drugs which swell very much when moistened, give the most trouble in percolation in the ordinary straight cylinders used, the reason is undoubtedly to be found in the compression occasioned by the swelling of the mass of vegetable matter in the cyllnder. If tightly packed when introduced, this expansion must cause an excessive compression of the particles upon each other and a consequent closing up of the pores through which the menstruum is designed to percolate.

This compression often amounts to a complete plugging up of the apparatus, even when the powder has been previously macerated, and has not been tightly packed; but when it has been only dampened, not swelled, before packing, as directed by Grahame, it becomes so completely compacted together as it swells, as entirely to prevent percolation.

This difficulty, which every tyro must be familiar with, is completely obviated by the use of a common funnel, with a loose plug of cotton in the tube; the pressure occasioned by the expansion of the mass as it becomes saturated with the liquid, instead of being confined, tends upwards as well as outwards, and thus as the mass becomes tighter it relieves itself by rising in the funnel, and is prevented from becoming so compressed as to interfere with its capillarity.

With the use of the common funnel, large or small at pleasure, I find my experience to coincide completely with that of Prof. Grahame. One experiment may be mentioned as illustrating the success of the process; 10,000 grains of English Colchicum corm, was powdered by Swift's Drug Mill, to about the fineness indicated by Grahame, dampened with diluted Acetic Acid, and packed with a pestle, as tightly as possible in a large glass funnel; a little more than a quart of the same menstruum was then added and thirty fluid ounces of liquid was obtained,—this first portion on evaporation, yielded 1750 grains of extract,—a second portion of menstruum was now added, and another thirty fluid ounces passed,—this yielded 390 grains, and a third por ion of the same bulk yielded only 38 grains.

The aggregate, 2178 grains, (not quite 22 per cent.) is rather less than I have obtained from some previous operations, but allowance must be made for the quality of the drug, which, in this instance, though remarkably fine, contained the outer

skin or envelope of the Corms, a part generally removed from the article, as found in commerce. The percolation, notwithstanding the aqueous menstruum, and the fineness of the powder, nearly all of which would have passed through a sieve of 50 meshes, was perfectly successful and not inconveniently slow.

What I have thus said of Grahame's process and of the use of the common funnel, may be construed as assenting too hastily to a practice of displacement quite contrary to that heretofore taught; but I present the limited experience I have acquired at this early stage of the investigation to induce others to follow in the same track, feeling the need of more definite, precise, and satisfactory directions for the management of the important process of displacement.

PHARMACEUTICAL STATISTICS OF SAXONY.

The "Zeitschr. des Statist. Bureaus" contains some statistics from which we extract the following:

In the kingdom of Saxony there were in 1856, 121 pharmaceutical stores, with "real concession;" that is, a license for conducting the business, resting on a certain house or real estate property, and which is transferable to another property—and 61 with "personal concession"—a license granted to a person and not easily transferable; five of this number are connected with charitable institutions. Since 1819 the number has increased from 128, or one store to each 10,461 inhabitants, to 177, or one to 11,644 inhabitants.

Exclusive of the principals, there were employed in these establishments 33 "Provisores," 165 clerks (gehilfen), and 93 apprentices. The yearly sales of most drug stores reach 3000 thalers (= 70 cts.), many are above that sum, and the sales of but few fall short of 2000 thalers; this amount is the pharmaceutical business, and does not include the branches frequently connected therewith, such as chemical manufactories, distilling establishments, &c.—*Dr. Hirzel's Zeitschr. f. Pharm.*, 1859, 12–14. J. M. M.

ON COLOCYNTH.

By Dr. G. F. Walz.

As a continuation of his former investigations on the various constituents of colocynth, the author now gives directions for their isolation; we extract the following from his paper:

Bruised colocynth is exhausted by alcohol of ·84 spec. grav., the tincture distilled and evaporated to dryness, the extract treated with cold water, the solution precipitated by sugar of lead, afterwards by subacetate of lead, and then by sulphuretted hydrogen; the yellow filtrate is precipitated by tannin and heated. The resinous mass is well washed with water, dissolved in alcohol, precipitated by subacetate of lead, the filtrate is freed from lead, digested with animal charcoal, evaporated and well washed with anhydrous ether; the golden yellow insoluble part is *colocynthin*.

That part of the alcoholic extract which is insoluble in water yields to ether *colocynthitin*, to be purified by treating its solution in absolute alcohol with animal charcoal, when it crystallizes in brilliant white oblique rhomboidal prisms. It is almost insoluble in cold absolute alcohol, crystallizes partly from the hot solution, another part gelatinizing in combination with alcohol and losing it but slowly. Colocynth contains but a very small proportion of colocynthitin.

The above precipitate with sugar of lead, after decomposition with hydrosulphuric acid, contains a reddish-brown body, with traces of colocynthitin soluble in ether, colocynthin and red brown coloring matter soluble in water, and another body soluble in alcohol. The sulphuret of lead yields to hot alcohol colocynthitin, the above body soluble in ether and alcohol, and the other substance soluble in alcohol.

The above precipitate with subacetate of lead, after decomposition, furnishes considerable colocynthin, very little matter soluble in ether, but principally two brown coloring matters, one soluble in water, one in alcohol. The sulphuret of lead contains a yellow substance soluble in ether, a little colocynthitin and coloring matter soluble in alcohol.

The above precipitate of sulphuret of lead imparts to alcohol a yellowish-red color, a strongly bitter taste, and contains the

yellow substance soluble in ether, and the reddish-brown body soluble in alcohol.

That part of the extract insoluble in water and containing the colocynthitin, consists, besides this, of coloring matter, the substance soluble in ether, and the one soluble in alcohol.

The aqueous solution, after the precipitation of colocynthin by tannin, on evaporation to one-half and neutralization with carbonate of soda, yields by tannin more colocynthin, to which much of the substance soluble in ether adheres. The filtrate, after precipitating with subacetate of lead and neutralizing with soda, yields another precipitate of colocynthin by tannin.

The exhausted colocynth imparts to boiling water much mucilage, which is precipitated by alcohol; the filtrate, if treated as above, yields another not inconsiderable quantity of colocynthin.

Pure colocynthin has the composition $C_{56}\,H_{42}\,O_{23}$; its aqueous solution is decomposed by sulphuric acid, yielding sugar and *colocynthein*, a resinous body, soluble in ether. $C_{56}\,H_{42}\,O_{23} + 2\,HO$ yield $C_{12}\,H_{12}\,O_{12} + C_{44}\,H_{32}\,O_{13}$ (colocynthein.)—*Wittstein's Viert. Schrift.* vii. 558—565. J. M. M.

ON OTTO OF ROSE.

By Daniel Hanbury, F. L. S.

The importance of authentic specimens is well understood by naturalists. The botanist who has had the opportunity of verifying the Linnæan name of a plant by comparing it with Linnæus's own specimen, is sensible that no more satisfactory proof is wanting. The entomologist who can appeal to the specimens of Fabricius, or the zoologist who can point to those named by Cuvier, as identical with his own, feels that he can rightfully adopt the names given by those authors. Nor is the student of Materia Medica much less in need of authentic or type specimens as standards of comparison. Yet how difficult it would be to point to a specimen of Sarsaparilla as indubitably the root of one particular species of *Smilax*, or to find in our museums a specimen of Myrrh or Olibanum, or Gamboge, with indisputable data as to its botanical origin and place of production.

These observations have been suggested by the difficulty which

occurs to the druggist in the purchase of Otto of Rose. The wholesale price of the article varies from 14*s.* to 26*s.* per ounce, a fact indicative of a wide range of qualities. But assuming that the most expensive article is the purest, it will be found to differ materially from the Otto described by our best authors. Pereira states* that at temperatures below 80° F., Attar of Roses is a crystalline solid; and the same assertion is made by Dr. Royle.† Brande states‡ that it melts at 84°; Redwood, that it fuses between 84° and 86°.§ Martiny gives 86° as its fusing point.‖ Chevallier, Richard, and Guillemin say that it is concrete below 84° to 86°.¶ Dr. Jackson states, of the Otto made at Ghazeepore, that it melts at 84°.**

Yet the Otto of the London market, as all druggists know, is never found with so high a fusing point, and in fact, there is but a portion of that which arrives, of which one could say that it is solid above 60° F.

These discrepant facts have long engaged my attention, and believing that the general subject of Otto of Rose merits the notice of pharmaceutists, I have placed on paper the observations which I have collected, and have now the honor of laying them before the Pharmaceutical Society.

For convenience, I think it best to discuss the subject under three heads, namely, *Production*, *Adulteration*, and *Chemical Characters*. First, then, the

Production of Otto of Rose.

The Otto of Rose with which at the present day the English market is supplied, is produced in Turkey, on the plains lying south of the Balkan Mountains.

Otto of Rose is also collected in Provence, in the South of France, by the distillers of Rose Water, and this Otto, the production of which is very limited, realizes a high price. In the

* Elements of Mat. Med. Ed. 8, vol. ii., p. 1812. † Manual of Mat. Med. Ed. 2, p. 432. ‡ Manual of Chemistry. Ed. 6, p. 1551. § Supplement to the Pharm. Ed. 5, p. 861. ‖ Encyklop. d. Med.-Pharm. Nat.-und Rohwaarenk. Bd. ii., p. 389. ¶ Dict. des Drog. t. iii. p. 158. ** O'Shaughnessy's Bengal Dispensatory (p. 328), in which work Dr. Jackson's interesting account is given at length.

state of Tunis, in Persia, and in the northern parts of India,* Otto of Rose is also manufactured, but none from these countries finds its way into the London Market.

With regard to Turkey, the chief localities in which the rose is cultivated for the production of Otto, are Kizanlik, a large town lying on the southern side of the Balkans, about seventy miles to the north of Adrianople. At Eski-Zaghra, in the valley of the Tunja, to the south-east of Kiranlik, the rose is also cultivated on a large scale, and at Carlova,† also on the southern side of the Balkans, about 100 miles from Adrianople, much Otto is said to be produced.

The flowering season commences in May, and the roses are usually collected before sunrise every morning. When the weather is dry and hot, the flowering season is short, and the roses blooming about the same time, it is impossible to collect them all.

The process followed is the simple one of distilling the roses with water in copper stills of no very considerable dimensions, and collecting the Otto from the distilled product.

In very favorable seasons, the three districts above mentioned can produce from 300,000 to 360,000 *meticals*, which, at six *meticals* to the ounce, would give from 50,000 to 60,000 ounces. This, however, is of rare occurrence, as, independently of the weather, other causes, as frost, or caterpillars, may reduce the crop.

I am informed that in the year 1854, the crop in the three districts above named, though not abundant, was calculated at 250,000 *meticals*, equal to 41,666 ounces; in the year 1855 it was estimated at 30,000 ounces; while in 1856 it did not much exceed 13,000 ounces.

The Otto of Rose is transported from the producing districts in large, flat, tin bottles, covered with thick, white felt, and

* Ghazeepore on the Ganges is famous for its manufacture of Rose Water and Otto of Rose. The latter I would willingly have examined, but have been unable to obtain a specimen, or, in fact, of any Indian Otto of Rose in a state of purity.

Tunisian Otto of Rose, valued at an enormous price, was sent to the Great Exhibition of 1851, but I had no opportunity of obtaining a sample.

† Sometimes spelt *Carloya*, but I cannot find it under either name, even upon the best maps.

bearing a calico label inscribed with Turkish characters. By the dealers at Constantinople it is transferred to cut and gilt glass bottles imported from Germany, and in these it usually finds its way to the markets of Europe. Sometimes, however, the large tin bottles are imported into London, it being supposed (and with some reason) that the Otto they contain has escaped being tampered with at Constantinople.

According to the official returns prepared for the Board of Trade, the quantities of Otto of Rose imported into the United Kingdom upon which duty was paid, were, during four years, as under :—

1854 - - -	1251 lbs.,	equal to	20,016 ounces
1855 - - -	1012 "	"	16,192 "
1856 - - -	1522 "	"	24,352 "
1857 - - -	1591 "	"	25,456 "

The duty is one shilling per pound.

Adulteration of Otto of Rose.

Although in Turkey the adulteration of Otto of Rose is sometimes practised by the producers, and especially of late years, since the repeal of a law in 1840 or 1841 prohibiting such adulteration under pain of death,* it is chiefly at Constantinople that this fraudulent practice takes place.

Among the substances which have been used for the adultera- of Otto of Rose, I may mention two as specially deserving attention. The first is Spermaceti, which, in Turkey, is, I am assured, frequently mixed with the cheaper qualities of Otto ; the second which is far more systematically and extensively employed, as well as more difficult of detection, is an essential oil, called in Turkish *Idris Yaghi.*† It is not unfrequently imported into

*I give this upon the authority of Mr. Edward Schnell, of Adrianople, to whom, through my friend Mr. Maltass, I am indebted for other particulars respecting the production of Otto of Rose in the Balkan.

†I have taken some pains to discover the signification of this name, but without much success. My friend Mr. Redhouse, thinks it is *Idris Yaghi*, which may signify *Marsh-mallow Oil:* and as there is a word in Turkish (*Ebé-gumdji*) which is used to denote both the Marsh-mallow and one of the common garden Geraniums, so it is possible that the Arabic *idris* may have the same double signification :—though the application of any term signifying *geranium* to the essential oil in question, is, as I shall show, only correct in so far as that there is a similarity of color.

London from Turkey, and is then known in the London drug trade as *Turkish Essence of Geranium.*

Let us consider what is its origin. The *Catalogue of the Turkish Section of the Great Exhibition of* 1851 states that it is brought from Mecca. A sample presented by M. Della Sudda to the Ecole de Pharmacie of Paris, has likewise this origin assigned to it.* I am, moreover, informed by my friend Mr. Maltass, that the Idris Oil found at Smyrna is all brought by the pilgrims arriving from Mecca. M. Guibourt has stated to me upon the authority of a gentleman at Constantinople, that the dealers there affirm that the oil in question comes from India by way of Egypt.

Although it is thus tolerably evident that the essential oil called the *Idris Yaghi* is imported from Mecca, or perhaps from Jeddah, the port of Mecca, all that we know of these places tends to show that it is not produced there. Mecca appears to have no manufactures, but to be entirely supported by the pilgrims who flock to its holy places: besides which the nature of the country and the climate, utterly forbid the idea of a green herb being produced in quantity for distillation.

Jeddah is also without manufactures, but it has a large trade with various ports on the Red Sea, as well as with India. Burckhardt, who visited it in 1814, has left a minute description of the various trades carried on, and even the number of persons engaged in each; and it is perfectly clear from his account, that even for the most trifling manufactured articles, Jeddah is dependent either on Egypt or India.†

From Bombay, on the other hand, an essential oil is exported, which is *undistinguishable* from the Turkish Essence of Geranium.‡ This liquid is known in India as *Roshé* or *Rosé* Oil, and in the London markets as *Oil of Ginger-Grass* or of *Geranium.* It is the produce of the more northern parts of India, where it is obtained by the distillation of certain grasses of the genus *Andropogon*, but the precise species of which I am at present unable from personal knowledge to name.

From the *Report on the External Commerce of Bombay*, for the year 1856–7, a valuable mass of statistics, compiled by R.

* Journal de Pharm. et de Chimie. Tome xxix. p. 310.

† Travels in Arabia, Lond. 1829, 4to, p. 41, &c.

‡ I must, however, admit that in English trade-lists the two are separately enumerated, the Turkish fetching a higher price.

Spooner, Esq., Reporter General, and published by authority of Government, I find that *Roshé* (or *Rosia*) *Oil* was exported from Bombay during the year in question to the extent of 1922 gallons. Of this enormous quantity, 541 gallons were shipped to England, and the remaining 1381 gallons to the Arabian Gulf. The *Report* does not state to what ports in the Arabian Gulf this quantity of Roshé Oil is shipped; but as none is reported as shipped to Aden or Suez (for which places, as for the United Kingdom or France, there are special returns,) it is plain that it is shipped to other ports than these.

Now, although there are several other ports in the Arabian Gulf, it is Jeddah the port of Mecca that stands foremost in importance. To quote a competent authority:*—"From its position, it is the entrepôt of all goods coming from India and Egypt. The merchants of Cosseir, Yambo, Hodeyda, and Massowah, draw their supplies from it." According to Burton, the value of the import trade of Jeddah with India amounts to about 25 *lacs* of rupees (£250,000) annually.†

Coupling these facts with the testimony of the Turks, that the volatile oil called *Idris Yaghi* is imported from Mecca, and still more with M. Guibourt's information that it is brought from India, I think there is good circumstantial evidence for identifying it with the *Roshé Oil* that is exported from Bombay; and when we consider the immense influx of pilgrims every year to Jeddah, the transport of the drug northward to Egypt and Turkey is easily explained.

Although I have thus demonstrated (as I think) the identity of the Turkish *Idris Yaghi* with the *Roshé Oil* of Bombay, and therefore proved them the produce of one or more species of *Andropogon*, growing in India, it may be proper that I should briefly state other reasons for considering that this volatile oil has no claim to the name often given to it of *Essence of Geranium*. I may say, then, that it differs from true essential Oil of Geranium, such as is distilled from a variety of *Pelargonium Radula* Ait. in the South of France.

1. In odor.

2. In optical properties—in having (according to the observations of my friend Dr. De Vry) no rotatory power when examined

* R. Innes, Esq., or Cairo, quoted in Parkyn's Life in Abyssynia, vol. i. p. 402.
† Pilgrimage in El-Medinah and Meccah, vol. iii. p. 379.

by polarized light, whereas, French Oil of Geranium possesses the power of right-handed rotation.*

2. In chemical properties, inasmuch as when exposed to the vapor of iodine, it does not acquire the intense coloration that occurs when Oil of Geranium is so treated.

4. In commercial value, true Oil of Geranium being worth six times the price of *Idris Yaghi*, and ten times that of the Bombay Roshé Oil.

Before being mixed with Otto, the *Idris Yaghi* is subjected by the Turkish dealers to some purifying process, chiefly, it would seem, with a view to diminish its color, a pale color in Otto of Rose being deemed a sign of goodness.

Chemical Characters of Otto of Rose.

As I have already observed, there exists, regarding the temperature at which Otto of Rose liquefies, great discrepancy between the statements of authors and the result of observations made upon the Otto of commerce.

Otto of Rose, it is well known, consists of two bodies, a liquid essential oil or elæoptene (upon which I have made no experiments) and a stearoptene. The stearoptene I find to be, when pure, a colorless crystallizable substance, devoid of odor and taste, fusing at 95° F., very slightly soluble in alcohol of sp. gr. ·838 in the cold, but more soluble if heated. It is soluble in the liquid portion or elæoptene of Otto of Rose, but, according to its abundance, separates more or less readily with a depression of temperature. It dissolves readily in ether, chloroform, or olive oil, but not in solution of potash or ammonia.

These two bodies, the elæoptene and stearoptene, exist, according to my observations, in the Otto of different districts in very different proportions, and to their relative amounts I attribute much of the variation which I find in the specimens examined. The amount of stearoptene was determined in a series of parallel experiments, conducted simultaneously by treating a given weight of Otto with alcohol (sp. gr. .838), throwing the precipitated stearoptene upon a filter and thoroughly washing it with fresh alcohol; the same amount of alcohol being employed

* But, as some essence of geranium from Algiers, examined by the same observer, was found to have the power of *left-handed* rotation to an almost equal extent, it is obviously *possible* that by mixing the two, an essence having *no* rotatory power might be produced—an improbable explanation, certainly, of the absence of rotatory power in the *Idris Yaghi*, but one which it is fair to mention.

in each case. The stearoptene was then pressed for some days between paper, and after exposure to the air and drying over oil of vitriol, was weighed.* The fusing point was determined in each case by the same thermometer placed by the side of the bottle, and the observations were confirmed by repeated trials.

The English and French samples experimented upon, were obtained direct from the manufacturers, and mostly upon my personal application. The Turkish sample No. 7, was manufactured at Kizanlik, where Messrs. Herman, from whom I received it, have an establishment.

The results I have tabulated as under :—

Table showing the Results of a comparative Examination of Twelve Samples of Otto of Rose.

No.	Place of Manufacture, and Manufacturer's Name.	Fusing Point.	Percentage of Stearoptene.	Other Characters.
	ENGLISH.			
1	London—Messrs. Allen and Hanburys.	91° F.	68.1	Of a pale straw colour, crystalline, odor weak and not remarkably fragrant.
2	London—Mr. Whipple, at Messrs. Barron and Co.'s.	87° F.	50.6	Resembles No. 1.
	FRENCH.			
3	Paris—M. Chardin Hadancourt.	85.5° F.	60.8	A crystalline mass, of a pale green color; odor weak but agreeable.
4	Grasse — M. Antoine Chiris.	74° F.	37.2	Of a straw color; when congealed, forming a highly crystalline mass; odor very fragrant.
5	Grasse—M. Mero.	71° F.	41.9	Of a brownish-yellow; forming, when congealed, a transparent mass of platy crystals.
6	Cannes—MM. Herman Frères.	70° F.	35.0	Resembles No. 4.
	TURKISH.			
7	Kizanlik.	65° F.	6.7	Color very pale yellow; when congealed, it constitutes a confused mass of platy crystals; odor exceedingly fragrant.
8	? seal G. S. & Co.	63° F.	7.3	Color very pale yellow; a mass of platy crystals when congealed.
9	?	62° F.	6.4	Resembles No. 8.
10	?	62° F.	6.6	The finest Otto of the London market. In its characters it resembles No. 8.
11	?	61° F.	4.6	Resembles No. 8.
12	? second quality.	56° F.	4.25	Wholesale price in London, in large quantities, 1*l*s. per ounce.

* I am quite aware that this method of determining the amount of stearoptene is not free from objection, since, the more abundant the elæoptene, the less will the stearoptene (in which it is soluble) be precipitated when the Otto is first treated with alcohol.

This table shows that the fusing point of Otto of Rose, and the proportion of stearoptene vary greatly in different samples. But it will also be observed that there is a similarity in the Otto produced in each locality. Thus, that of the South of England and North of France (samples Nos. 1, 2, and 3) has a high fusing point (varying from 85° to 91°), and contains a large percentage (50 to 68) of stearoptene. The Otto of the South of France fuses between 70° and 74°, and affords from 35 to 41 per cent. of stearoptene. That of Turkey, if we may consider samples Nos. 8, 9 and 10 as equally genuine with No. 7 (Messrs. Herman's), fuses at from 65° to 62°, and affords from 7.3 to 6.4 per cent. of stearoptene.* Sample No. 11 may be regarded with some suspicion from its resemblance to No. 12—the latter being acknowledged of inferior quality.

Whether the differences that exist in the characters of the different kinds of Otto, are the result of climate or of the method of manufacture, or whether (especially in the case of the Turkish Otto) they are to be traced to a difference in the species of rose, are questions for determining which I have at present no sufficient data.—*London Pharm. Journ.*, April, 1859.

ON GRATIOLA OFFICINALIS.

By Dr. F. G. Walz.

Some time ago the author made an analysis of Gratiola officinalis, and obtained the following distinct principles: Gratiolin, Gratiosolin, Gratiolacrin, fixed oil, brown resin, tannin and a volatile acid, called antirrhinic acid, which is present in many plants belonging to the family of Scrophularineæ. He has now examined some of the above principles and the products of their decomposition.

Gratiolin. The aqueous infusion is precipitated by subacetate of lead, the lead removed, the liquid precipitated with tannin, the washed precipitate exhausted by alcohol, digested with hydrated oxide of lead, treated with animal charcoal, evaporated, the dry powder extracted with ether, the residue washed with

* The test used in Turkey by the persons who purchase Otto from the producers, is to plunge a small vial of it into water at 10° Réaumur (= 55° F.). If, in the space of five minutes, the Otto congeals, it is regarded as genuine.

cold water, which dissolves the greater part, gratiosolin; the insoluble residue is gratiolin, which is entirely freed from gratiosolin by precipitating its concentrated alcoholic solution by water, and from gratiolacrin by precipitating this from the alcoholic solution with sugar of lead; it is recrystallized from boiling water. Its composition is $C_{40}\ H_{34}\ O_{14}$.

By continued boiling with dilute sulphuric acid, it is decomposed into sugar and an oily liquid, solidifying on cooling to a yellow resinous mass, soluble in alcohol and ether, *gratioleretin*, and into brilliant white prisms, insoluble in water and ether, soluble in alcohol, coloring oil of vitriol green, *gratioletin*.

$$\underbrace{2\ C_{40}\ H_{34}\ O_{14}}_{\text{Gratiolin.}} = \underbrace{C_{12}\ H_{12}\ O_{12}}_{\text{Glucose.}} + \underbrace{C_{34}\ H_{28}\ O_{6}}_{\text{Gratioleretin.}} + \underbrace{C_{34}\ H_{28}\ O_{10}}_{\text{Gratioletin.}}$$

Gratiosolin constitutes the principal part of the crude gratiolin, from which it is gained by washing with water, evaporating the solution and washing the product with anhydrous ether; its composition is $C_{46}\ H_{42}\ O_{25}$. At ordinary temperature it is decomposed by alkalies and dilute acids into grape sugar and *gratiosoletin* $C_{40}\ H_{34}\ O_{17}$, which is likewise soluble in water and precipitated by tannin. When pure it is of a golden yellow color, very bitter taste, easily soluble in water and alcohol, insoluble in ether. Its aqueous solution when heated with diluted acid, is decomposed into sugar and a resinous substance, the latter being a mixture of two bodies separable by ether. *Gratiosoleretin* $C_{34}\ H_{26}\ O_{9}$ has a yellow color, scarcely any taste or smell, is insoluble in water, easily soluble in alcohol and ether. *Hydrogratiosoleretin* $C_{34}\ H_{28}\ O_{11}$ has a purely yellow color, and faint resinous odor; it is insoluble in water and absolute ether, but soluble in alcohol.

Gratiolacrin. The crude gratiolacrin, as obtained on treating crude gratiolin with ether, is a very bitter acrid resin, containing a fixed oil from which it may be freed by solution in cold absolute alcohol. The residue is partly dissolved by ammonia of ·960 spec. grav.; the insoluble part, when treated with cold alcohol, leaves a white crystalline powder, crystallizing in fine white crystals from boiling alcohol.

The cold alcohol solution has an intensely acrid burning and bitter taste; by precipitating with sugar of lead and decompos-

ing with sulphuretted hydrogen, a fixed oil is obtained of a peculiar fatty odor, and the composition C_{31} H_{29} O_4.—*Wittstein's Vierteljahresschrift*, viii. 7—22. J. M. M.

ON SAMADERINE.

The *Samadera indica*, Gärtn. (*Vitmannia elliptica*, Vahl), called *Gatip Pahit* by the Malays, is a tree occurring in Java in the Regency of Bautam, and belonging, according to Bartling, to the class of the *Terebinthinæ*, and the order *Simarubeæ*. C. L. Blume, who is at present residing in Java, has given a fuller description of this tree.

The tree is especially characterized by its numerous fruits, which, enclosed in coriaceous shells, are of the form of almonds, and weigh about $1\frac{1}{5}$ grm. They are very rich in oil, and are distinguished, as is also the bark of the tree, by a very bitter taste. This bitter is perhaps the bitterest in the whole vegetable kingdom, and is exceeded by no other known bitter matter. To this circumstance we are indebted for the preliminary investigation, for which M. Rost von Tonningen of Buitenzorg, in Java, furnished the material; this, however, will be carried on on a larger scale as soon as a greater quantity of the bark and fruits are collected and preserved.

100 parts of the fruits and bark of *Samadera indica* contain:—

	The fruits.	The bark.
Portions soluble in ether (oil) . .	34·260 (fat)	1·409
" " alcohol (resin) . .	8·380	5·119
" " water (tannic acid,) samaderine, extractive matter, &c.) . .	10·585	1·203
" " potash (pectic acid) .	0·160	traces
Mineral portions	2·733	7·931
Cellulose	39·000	70·656
Water	4·577	11·832
Loss	0·305	0·850

The properties of these bodies were as follows:—

The oil of the fruits is colorless, possesses a peculiar odor, no known taste, and is lighter than water; it burns with a

yellowish-white and afterwards red flame, and forms soaps with alkalies.

The resin of the fruits is a brown substance of a very bitter taste, which attracts moisture rapidly from the air, and then deliquesces. Water dissolves a little of it, and this solution furnishes a black precipitate with solution of perchloride of iron (tannate). When heated it melts, becomes inflated, and burns very readily, diffusing a resinous odor, and leaving behind a pale grey ash, which is almost soluble in water. It consists for the most part of chlorides of lime and potash with traces of iron.

The portions soluble in water are of a pale brown color, and when evaporated leave an extract, which deliquesces in the air. They are as bitter as the alcoholic extracts, and consist of a mixture of extractive matter, sugar, tannic acid, and samaderine.

The ash which they leave after combustion, effervesces strongly with acids, and consists principally of chlorides of lime and potash.

The fat of the bark is pale yellow, has a neutral reaction, and possesses an oily bitter taste (caused by the solution of some samaderine in ether not quite free from water;) it is of a soft resinous consistency, and may be drawn out into threads. It is only partially saponifiable, and consists of a mixture of fat and a resinous body.

The resin of the bark agrees nearly with that of the fruits, but its aqueous solution furnishes a far stronger precipitate with perchloride of iron than that obtained from the fruits.

The portions of the bark soluble in water had the same properties as those of the fruits.

The most important constituent of the bark and fruits of *Samadera indica* is undoubtedly the samaderine contained in them. It is obtained by evaporating the aqueous decoction of the bark and fruit to the consistence of an extract; this is treated repeatedly with small quantities of alcohol, by which means the greatest part of the samaderine is left behind. It may be obtained pure by solution in water and treatment with animal charcoal.

Samaderine is of a brilliant white color, laminarly and somewhat plumosely crystalline. Its taste is more persistently and

intensely bitter than that of any other body with which the author is acquainted. When heated, it melts and evolves fumes which, when inhaled, possess a bitter and acrid taste; when the heat is continued, it becomes carbonized and burnt away, without leaving any trace of ash.

It dissolves in water more easily than in alcohol, and its solutions are perfectly neutral. It does not exert the least reaction upon ferridcyanide of potassium, sulphate of copper, nitrate of silver, chloride of platinum, tincture of iodine, protosulphate of iron, perchloride of iron, and chromate of potash. Nitric and muriatic acids give it a yellow color, whilst by the addition of concentrated sulphuric acid a beautiful reddish-violet color is produced, which disappears in course of time, and leaves a mass of feathery, strongly iridescent crystals, which will be more closely investigated hereafter.

Samaderine may be placed in the series of indifferent, crystallizable organic bodies, to which salicine, phloridzine, &c., belong. As soon as it has been prepared in larger quantities, further investigations upon it shall be published; the question will then also be solved, whether samaderine, which gives so distinct a reaction with sulphuric acid, is converted thereby into another compound and grape-sugar, like salicine and phloridzine.—*London Chem. Gaz., April* 15, 1859, *from Archiv der Pharmacie.*

PREPARATION OF PLATINUM-BLACK.

By C. Brunner.

We possess several methods for the preparation of platinum in that state which is usually termed *platinum-black*, on account of its black color. In most of the recent modes of preparation, organic substances, such as alcohol, sugar, &c., are employed as reducing agents, by which means there is always a doubt whether a certain quantity, perhaps very small, of organic substance may not adhere to the preparation.

Perfectly pure platinum-black may be very easily obtained in the following way, without the employment of any organic substance:—

Dry peroxalate of iron (prepared by precipitating sulphate of

iron with oxalic acid and washing) is heated in a shallow capsule until it begins to smoulder, when the heat is continued with stirring until the salt is entirely converted into peroxide. The extremely fine powder thus prepared, is reduced at an incipient red heat by a current of dry hydrogen gas in a glass tube. After it has become quite cold in the current of gas, the preparation, which is sometimes pyrophorous, is poured into a capsule with water, and gently crushed in it with a pestle. Of this metallic iron stirred up with water, small portions are then poured into a dilute solution of perchloride of platinum containing a small excess of muriatic acid, until this, after violent shaking and standing for some time, appears to be entirely deprived of color. The precipitate obtained is then separated from the fluid by decantation, and boiled repeatedly with concentrated nitric acid until the extract contains no noticeable amount of iron, when the adherent nitric acid is removed by a weak solution of potash.

The preparation thus obtained is an amorphous black powder, which acquires an iron-like lustre by trituration in an agate mortar. When heated in a platinum spoon, it suddenly becomes ignited at about 392° F., and becomes converted into the ordinary form resembling spongy platinum, its volume at the same time being doubled. When moistened with a drop of alcohol, it also became ignited in a second or two, and converted into the ordinary form.

There is no doubt that the preparation will possess all the other known properties of platinum-black. Should this substance ever be required in large quantities, the simplicity of this mode of preparation will recommend its adoption.—*London Chem. Gaz., April* 15, 1859, *from Dingler's Polytechn. Journal.*

ON A NEW REMEDY FOR HYDROPHOBIA.

By Dr. Eulenburg.

On the 24th of August, last year, Guerin-Meneville submitted to the Paris Academy a report on the cure of hydrophobia, by the use of powdered cetoin, the French name for Cetonia aurata, the chemical examination of which was entrusted to Berthelot and de Luca. Nothing as yet has become known of the in-

vestigations of the Academy. The author having occasion to obtain some information regarding the use of this remedy, in some parts of Russia, states that the physician of the Princess Orloff had this bug examined by Bach, of Boppard, who found it to be Cetonia aurata, which, according to reliable information, has cured twenty-one mad dogs and four cases of hydrophobia in men.

The bug belongs to the family of Scarabæides, or Lamellicornes of Latreille; it is flat, has a strong metallic lustre, the body is of a copper red, the upper part of a golden green color, it is seldom red all over; deepened, curved lines run across the sheath wings, more or less marked with white spots; size .6 to .9 inches. When in danger, the bug emits from all points a greyish mass of a disagreeable odor. Its larva lives generally in the nests of ants (Formica rufa,) and has been collected in July and August for the above purpose; one tea-spoonful of the powder is said to be sufficient for men or dogs. It is worth while to draw attention to such a simple remedy.

Empiricism has a vast field with hydrophobia, and probably no where else has the attempt been oftener made to find a specific for a disease.—*Dr. Wachtel's Zeitschrift—Wittst. Viert. Schr.* viii. 85,86.

ON A RED CANELLA BARK FROM THE WEST INDIES.

By W. F. Daniell, M. D.

Hon. Member of the Pharmaceutical Society of Great Britain, &c.

During a recent sojourn in St. Jago de la Vega, Jamaica, I received, through the kindness of my friend Mr. March, specimens of a red bark of considerable pungency, obtained from a tree, indigenous to the hilly districts in the neighborhood of the town. The hot and peppery qualities of this cortical substance led me to infer that it belonged to a species of *Canella*. Mr. March, who is well acquainted with the botany of the island, had previously entertained a similar opinion, which was subsequently confirmed by the discovery of the plant which had furnished the bark. An examination of the botanical characters indicated its identity or close affinity with the *Canella alba*,

Murray. Two varieties of this species dependent on the form of leaves are, however, known to exist in the mountain forests; one of these may probably be the *C. laurifolia* of Don. My friend suspected this cortex might have been taken from a *Cinnamodendron*, but in a letter he informs me that, having compared the red Canella with the latter, he found the wood and bark were "apparently quite distinct." The only doubt that remained relative to the identification of the plant proceeded merely from the flowers, which were not sufficiently perfect for investigation. The *Cinnamodendron* above alluded to, is, no doubt, the *C. corticosum*, Miers, lately described by Mr. Miers in an elaborate paper on the *Canellaceæ*. This author states that "its bark has the same aromatic properties as that of *Canella alba*, from which it is scarcely distinguishable, both being collected and exported under the same name," and he moreover observes that in the two species of *Cinnamodendron* known, the flowers are constantly axillary.*

Having frequently compared my specimens with the bark of living plants of *Canella alba*, which abundantly flourish in several of the Bahama Islands, I noticed they afforded many points of similarity. The warm aromatic properties, rugged epidermis, and peculiar double cortical layers were common to both, and with the exception of the red line, and perhaps a greater degree of pungency of the inner cortical layer of the former, no special differences could be detected.

It may therefore not be unreasonable to suppose that fragments of this kind of Canella were occasionally exported to Europe in former years, and lead John Bauhin and subsequent writers to confound it with Winter's bark (*Drimys Winteri*, Forst.), under the term of *Cortex Winteranus spurius*.

As the evidence so far is decidedly in favor of this bark belonging to a species of *Canella* rather than *Cinnamodendron*, it has been proposed to provisionally designate this product (from the distinctive red color) by the title of *Canella rubra*.—*Phar. Jour. and Trans., London, April* 1, 1859.

* The following note has since been received by Mr. Bentley, from Dr. Daniell:—

"I omitted to state in my paper on the Red Canella Bark, that the flowers of the tree which produced it were terminal, and were examined by Mr. March, but not with sufficient minuteness to determine their structure, as they are partially decayed."

TO PREVENT CONCUSSIONS ON BOILING IN GLASS VESSELS.

By Dr. G. C. Wittstein.

On heating clear liquids in glass vessels, it frequently occurs that they for a long time do not come to boiling, and sometimes, all at once, boil up, foaming, with violent concussions. This occurs more frequently with alcoholic and ethereal solutions, and may be explained by an over-heating of the liquid, caused by an even distribution and consequent accumulation of heat. It is necessary, therefore, to counteract this tendency by causing a more rapid current of the heat towards the surface. Such a current is caused by the presence of a projecting solid body on the bottom of the vessel, such as a grain of sand, a piece of glass, quartz, or platinum. But thus the purpose is only partly accomplished; the current commencing on the lowest point of the body, is lost from the upper point in the liquid above, particularly if its height be considerable, and the same phenomenon of concussions may occur, though generally with much less violence.

All inconveniences will be entirely obviated, if proper care is taken to conduct the heat from the bottom to the surface; a glass rod will answer for this purpose; but for liquids of a high boiling point, such as sulphuric acid, a better conductor is to be chosen, and a platina wire of the thickness of a knitting needle is the most proper one. Since I have distilled alcoholic, ethereal, aqueous, &c., liquids, with a glass rod of the proper length introduced, all danger of foaming and concussions have been obviated; the contents of the retort rapidly come to the boiling point and continue to boil quietly.— *Wittstein's Viert. Schr.* viii. 104

J. M. M.

PREPARATION OF MOLYBDATE OF AMMONIA.

By C. Brunner.

Since the employment of this salt for the detection of phosphoric acid has become indispensable in chemical analyses, several methods have been recommended for its preparation. Most of these start from the roasting of native sulphuret of molybdenum in contact with the air, until all the sulphur is burnt away

and the molybdenum is converted into molybdic acid which is afterwards dissolved in ammonia; this operation is usually carried on in an obliquely placed platinum crucible, the mass being frequently stirred, but it is very tedious. The improvement of this method lately described by Wöhler, in which a draught of air produced by an aspirator is employed, also effects the object, but slowly. The reason of this is to be found partly in the difficulty of dividing the material sufficiently, as it always cakes together again when heated, and partly in the fact that the molybdic acid produced covers the residue of the mineral and thus renders its ignition difficult.

The operation may be effected very easily in the following way:—The sulphuret of molybdenum is triturated in an agate mortar with an equal volume of coarse quartz-sand washed with muriatic acid until it forms a moderately fine powder, which is placed in a shallow platinum cup or on platinum foil, and heated over a good spirit-lamp to the commencement of incandescence, stirring it frequently until the mixture has acquired a citron-yellow color (whitish, on cooling). A quarter of an hour is sufficient to effect this with several grammes of the mixture. When cool, the mass is extracted with liquid ammonia and further treated in the usual way.—*London Chem. Gaz. April* 15, *from Dingler's Polyt. Journal, cl. p.* 72.

ON FLUID EXTRACT OF BUCHU.

By Israel J. Graham.

Among the important preparations of the class here alluded to, not included in the officinal list, is the *fluid extract of buchu.* Although a preparation of nostrum celebrity had long been in use under this name, but which possessed very little of the characteristics of the plant it professed to represent, it was not till after the adoption of the present Pharmacopœia, that Wm. Procter, Jr., proposed a formula for its preparation in accordance with the peculiar properties of the drug, since which time it has been extensively used in medical practice, and made mostly by his process or with slight modifications of it. It is one of those fluid extracts which require the use of an alcoholic sol-

vent, and the retention of a considerable part of the alcohol to hold in solution its active qualities, which are principally due to volatile oil.

The following formula which is proposed as a substitute for those now in use, not only contemplates an increase of strength whereby the dose is proportionally reduced, and less alcohol administered with each dose, but the complete exhaustion of the drug with economy of time and ease in manipulation.

Fluid Extract of Buchu.

Take of Buchu in moderately fine powder, sixteen ounces.
Diluted alcohol (Alcohol 95 p. c. 2 parts, water 1 part) a sufficient quantity.

Dampen the powder with the diluted alcohol and pack firmly in a suitable displacer, place over the surface a piece of perforated filtering paper and pour on the diluted alcohol; when all of the highly charged liquid (about one pint) has passed, remove it and submit to spontaneous evaporation until reduced to fourteen fluid ounces; continue the percolation until exhausted or about one pint more is obtained, evaporate this at a temperature of 120° or 130° F. until reduced to two fluid ounces, and mix it with the first portion. Filtration may be resorted to if necessary, but is scarcely requisite.

Thus made, fluid extract of buchu is a dark olive-brown liquid, possessing to the fullest extent the peculiar qualities of the drug, and may be given in doses from twenty to thirty minims representing as many grains of the substance.—*Jour. and Trans. Md. Coll. Phar. March*, 1859.

ON THE DETECTION OF IODINE IN URINE.

By Prof. Dr. X. Landerer.

It is not so easy as might be supposed, to detect iodine in urine; I was unable to obtain a reaction with chloride of palladium in cases where, according to my opinion, urine ought to have contained iodine. The excretion of iodine by urine seems to depend on the nature of the preparation administered, for the urine of persons who had been taking pills of iodide of iron for a considerable time was free of iodine and iron, though the black color of the fæces showed the presence of iron therein. After the

employment of Ricord's pills of iodide of mercury, and after the daily external use of tincture of iodine, no iodine could be found in the urine.

It is different when iodides enter the organism in aqueous solution; after the administration of 4 drachms iodide of potassium, the presence of iodine was proved in the urine.

When making such examinations, I evaporate the urine nearly to dryness, digest with alcohol, filter, evaporate to dryness, dissolve in a little water and divide the solution in two parts; to one I add solution of chloride of palladium, to the other starch and chlorine water.— *Wittstein's Viert. Schr.* vii. 546. J. M. M.

ANALYSIS OF THE FLOWERS OF DAPHNE MEZEREUM.

By J. B. Enz.

The author examined the flowers of Daphne mezereum with the following results:

The aqueous distillate had an agreeable odor without separating any volatile oil, which was obtained by shaking the distillate with ether and evaporating spontaneously.

Daphnin was obtained by Gmelin and Baer's process: the alcoholic extract was exhausted with water, the solution precipitated by sub-acetate of lead, the washed precipitate decomposed by hydrosulphuric acid, evaporated, dissolved in alcohol and evaporated spontaneously.

The author found, besides volatile oil and daphnin, traces of tannic acid of the variety that produces green precipitates with iron, salts, wax, fatty matter, green acrid soft resin, sugar, red coloring matter, mucilage (bassorin), nitrogenous matter, albumen, potassa and lime, salts of vegetable acids and lignin.

1000 parts of fresh flowers contained water 792, matter soluble in ether 88, in alcohol 34, in water 26, in diluted muriatic acid 20, lignin 40.— *Wittstein's Viert. Schr. viij.* 23–26.

J. M. M.

ANALYSIS OF THE ROOT OF ARUM MACULATUM.

By J. B. Enz.

The author found the juice to have a neutral reaction. All the information regarding the volatile acrid principle consists in

the statement, that the distillate is of neutral reaction, colorless, of a radish-like smell and acrid taste, no volatile oil was separated, subacetate of lead produced a white pulverulent precipitate, soluble in nitric acid, nitrate of silver and freshly precipitated oxide of lead, no alteration; the distillate is free of sulphur.

The author obtained some granular crystals of sweetish bitter, acrid taste, which he supposes to be saponin.

1000 parts of the recently collected root contained 584 parts, water, 52 lignin, 272 starch, and yielded to ether 24 parts, to alcohol 40 parts, to cold water 28 parts.

The ethereal tincture contained fixed oil, fermentable sugar, saponin and the acrid volatile principle; in the alcoholic tincture was found fermentable sugar, saponin, resin; in the cold aqueous infusion, mucilage, gum, albumen, phosphate of lime.—*Wittstein's Viert. Schrift.* viii. 27—31. J. M. M.

ON THE YELLOW COLORING MATTER OF THE AUTUMNAL LEAVES.

By A. Ferrein.

The author, after reviewing the investigations of Macaire-Prinsep and Berzelius, proceeds with his experiments made with leaves of a purely yellow color, collected from Ulmus campestris. 1¾ lb of the powdered dried leaves were exhausted with 90 per cent. alcohol, filtered, the greater part of the alcohol distilled off and evaporated to about 6 oz. This residue was a thin liquid, of a blackish brown color and a characteristic smell of fresh bread. After standing, the resinous and waxy matters were separated by filtration and washed with warm water. The liquid now had a bitter astringent taste and acid re-action. By dilution with water all the resinous and waxy matters were separated, and the filtrate now had a yellowish-brown color. It was precipitated by sugar of lead, a part of the precipitate decomposed by hydrosulphuric acid. The solution had an insipid acidulous taste, perceptibly astringent, and reddened litmus. Solution of glue did not precipitate it, but softened ichthyocolla rendered it colorless and tasteless and without action on lit-

mus. This coloring acid, therefore, is a tannin for which the name of *Xanthotannic Acid* is proposed. On analyzing the lead compound, the results obtained indicate the following composition: $3\,PbO + C_{28}H_{18}C_4$ — *Wittstein's Viert. Schrift.* viii., 1—7. J. M. M.

NEW METHOD OF PREPARING SULPHUROUS ACID.

By E. F. Anthon.

There are various methods of preparing sulphurous acid, of which, however, those only are usually employed which depend on the combustion of sulphur (or iron pyrites), or upon the decomposition of heated concentrated sulphuric acid by sawdust and the like, or by metals.

The first of these methods is certainly simple and cheap, but it is not applicable in many cases. The decomposition of sulphuric acid by copper or mercury is expensive, and also presents other inconveniences. The decomposition of sulphuric acid by chips of wood and other organic matters is also expensive, because in consequence of their great volume, a great excess of sulphuric acid must be employed, which escapes decomposition. Moreover, the sulphurous acid thus obtained is contaminated with more or less carbonic acid.

(The preparation of sulphurous acid by decomposition with charcoal, which is easily effected, is passed over by the author, and consequently the question is left unanswered, whether the preparation of sulphurous acid by boiling sulphuric acid with sulphur is more convenient than this. It appears from the original that the fact that sulphuric acid is decomposed by boiling with sulphur is unknown to the author, and yet it is now indicated in the Chemical Text books. The method described by the author is consequently not new, and therefore only deserves further notice, if it be more convenient for the preparation of sulphurous acid than it was supposed to be.—Ed. *Chem. Centralblatt.*)

The author placed

2 ounces of sulphur in fragments, and
25 ounces of concentrated sulphuric acid

into a glass flask, furnished with a gas-tube, and heated it over a spirit-lamp. The sulphur soon melted, and in a short time there was an evolution of sulphurous acid which was conducted into water. The evolution was very uniform, and the burning of the spirit-lamp was continued until, after about six hours, there was only a comparatively small residue in the flask.

During this treatment the sulphur constantly floated in the form of a transparent, hyacinth-red, thickly fluid mass on the hot sulphuric acid, and a small portion of it sublimed; part of this condensed again in drops upon the walls of the flask, and flowed back into the acid, whilst another part was deposited in the form of a thin crust in the neck of the flask. Very small quantities of sulphur were carried further mechanically by the sulphurous acid, and deposited in the conducting-tube, and the water placed to absorb the gas.

After the conclusion of the process, the flask contained only

4½ drachms of sulphuric acid, and
32 grains of unaltered sulphur.

The advantages of this process are:—

1. That it furnishes a pure product;
2. That it is easily effected, and cheap;
3. That the evolution of sulphurous acid gas is very uniform, the reason of which is that the sulphuric acid always acts only upon the outer surface of the melted sulphur, and this always forms a coherent mass; and
4. That no solid deposit settles to the bottom of the vessel of evolution, which, in other methods, so often occasions the cracking of the vessel.—*London Chem. Gaz., Mar.* 15, 1859, *from Dingler's Polyt. Journal* and *Chem. Centralblatt.*

THE PROCESS OF PERCOLATION OR DISPLACEMENT.

(An extract from a paper read before the American Pharmaceutical Association, and published in its Proceedings for 1858).

By Israel J. Graham.

The author after alluding to the history of the process in its application to pharmacy, and reviewing the usual modes of conducting it, says:

The great beauty and excellency of the process I consider to be in the concentrative power, rapidity and efficiency of its operation. It is frequently very desirable to obtain quickly solutions at once so concentrated as to possess nearly or quite all that is active in the substance under treatment, and which in quantity is sometimes less, and often not more than would be sufficient to thoroughly moisten the substance in accordance with the officinal directions; and being thus diffused through the mass it cannot be so completely displaced, and at the same time the material so thoroughly exhausted, as it could be if the process was conducted under other circumstances.

What then are the circumstances so favorable to the successful prosecution of the process, in the attainment of results so reliable and advantageous? It may not be out of place, in the first instance, briefly to allude to the apparatus. This may be of various materials, as metal, glass, porcelain, &c., and either cylindrical or slightly conical, terminating somewhat funnel-shaped, and with or without a diaphragm, as this can be supplied with a substitute of carded cotton.

For almost all the operations of the pharmaceutist, except in a few instances, when a larger apparatus is required, I know of no instrument that answers the purpose better than the common glass funnel; funnels less cone-shaped than would be selected for filtering purposes, ordinarily termed badly-shaped funnels, and which can be had at a very trifling expense. These may be arranged for an apparatus by having the upper part of the neck filled with carded cotton on which the material rests; over this a piece of perforated paper is placed, and in some cases there will be an advantage in placing on the paper a piece of perforated tin, having a small knob in the centre, by which to handle it. I recommend the funnel, because, in the first place, it is always at hand, and, if not, can be supplied at so little cost; and secondly, because I know that its form does not impede the process, although some have so asserted; and lastly, because, being glass, it enables the operator to watch the process, and see whether or not it is progressing satisfactorily. On this latter account I prefer glass instruments before all others. In very large operations the form of the apparatus may be adapted to the occasion, as the experience of the operator may suggest.

Even in operating with volatile fluids, such as ether, spt. ammon. arom., &c., in the absence of a better instrument, the funnel may be made to answer by tying over the top a piece of oiled silk and inserting the neck tightly in a cork arranged to receive it.

Having procured the proper form of apparatus, the next consideration is the degree of comminution to which to reduce the material we wish to operate upon. An experience of many years in treatment by percolation, induces me to recommend, in all cases, that the substance be brought to a state of fine division, of uniform character, particularly those which are of a firm and hard texture; but in all instances, the material should be passed through a sieve. The size of the sieve will necessarily vary; with most substances, one of about sixty meshes to the inch, especially for tinctures, will be found best adapted, while with some other substances, such as rhubarb, gentian, &c., one of about forty meshes will be preferable.

The state of comminution to which substances are brought previous to treatment by percolation, I conceive to be one of the most important conditions of a successful result. Next in importance to this, is the amount of menstruum added to the powder previous to packing it in the apparatus.

As in the previous case, I have also in this, to depart from the rules laid down in the standard works treating of this subject; for this condition regulates, in a great measure, the next and last important feature to be observed, that is, the packing of the powder in the apparatus.

As already referred to, the officinal directions, as well as common usage, imply the necessity of sufficient of the menstruum to be added, to form a soft, pulp-like mass with the powder, and in some instances a much larger quantity; and suffer the mixture to stand some time before transferring to the percolator. It is almost impossible to so regulate the packing of the powder when in this condition, as to produce that uniform and steady permeation of the liquid through the mass, so essential to complete success. Hence it is, that instruments furnished with stopcocks or other arrangements, are recommended to control the flow of liquid; an appendage to the apparatus wholly unnecessary, as the process, when properly begun, is its own regulator with unvarying certainty.

Contrary to the prescribed rules in this particular, my plan is to add just sufficient of the solvent to dampen the powder, scarcely destroying its pulverulent condition, regardless whether the substance be liable to much swelling on imbibing the liquid, or not; the object being to enable it to pack properly, and at the same time to contain sufficient moisture to produce capillary attraction to conduct the liquid; by which means the fluid with which the powder was moistened, on the subsequent addition of the menstruum to the packed powder in the percolator, is driven forward very highly charged with soluble matter, and escapes at once, perfectly clear, followed in regular and uniform succession by liquid more or less strong as it advances; and in a comparatively short time—frequently several hours less than is directed for previous maceration by the Pharmacopœia—the powder will be left in the displacer completely exhausted of its soluble matter.

By this means highly concentrated solutions are obtained—an advantage gained by this small addition of liquid to the powder at first, in connection with the manner of packing, which will be referred to presently—and may be explained thus: the quantity of liquid absorbed being minute, on the subsequent addition of the menstruum it is displaced, and other particles becoming saturated in quick succession, dispose the substance to yield up its soluble matter to the least possible amount of solvent. The liquid, by this means of treatment, having permeated the particles of the mass, without having had any of the particles diffused or suspended in it, will necessarily escape from the instrument perfectly clear, as already stated, and almost of a syrupy consistence; and, for obvious reasons, should not be returned to the mass, as is frequently requisite when the usual manner of previous maceration is resorted to.

The manner of adding the liquid may be worthy of some notice. I found it best to distribute the liquid over the powder in portions, the quantity generally not more than one-fourth of the substance under treatment, frequently less, especially with such substances as rhubarb, gentian, &c., and with my fingers or whole hand, according to the quantity, rub it through the powder uniformly, the state of this being the guide for the proper quantity, which should never be sufficient to produce a soft

mass, but merely to dampen the powder without causing it to lose entirely its mobile condition. In this state the operator will be able to judge, at once, by the feel of the powder, respecting the next step of the process—that of packing—whether it should be performed with little or much pressure. If the powder should, when thus moistened, manifest a tendency to adhere much among its particles, the packing should be performed with moderate pressure only, and in some instances, scarcely any, especially with an aqueous solvent; if on the other hand, this adhesiveness should not exist, and the particles of the powder move freely upon each other, as with many alcoholic and hydro-alcoholic liquids, the pressure should be considerable. As a general rule, considerable pressure may be used with most substances; but, as before stated, the operator will soon learn to distinguish the requisite condition in this respect.

The dampened powder should then be immediately transferred to the percolator, and *all* of it thus transferred before any pressure is exerted upon it, so as to insure the powder to be of uniform condition throughout; which cannot be the case if one portion of it is packed before adding another; as the first may not only be packed more tightly or more loosely, but, in consequence of evaporation during packing, will be dryer than the portion which is to be added, and all combined will tend to direct the permeation of the fluid unequally; and consequently the process cannot progress successfully.

If it is desired, as in some cases may be necessary, as with wild cherry bark, to permit the full effect of the water or other menstruum, in the developement of the active principle, it may be accomplished by adding only a small portion of the menstruum to the packed powder—a quantity that will be absorbed by the powder, but insufficient to produce dropping; and at the proper time, make the further additions of liquid.

When it is not thus requisite for any peculiar action of the menstruum, the whole quantity of liquid (or to the capacity of the instrument), may be added at once on the surface of the packed powder, arranged in the manner before stated.

Should a funnel be used, it will be necessary to lay across the top a piece of oiled silk to prevent evaporation.

In the treatment of some substances, as opium, myrrh, &c., it is necessary to mingle with them some suitable material for the

purpose of properly dividing them so as to be acted upon uniformly by the menstruum, and facilitating the process.

Frequently, in compound preparations wherein these substances may enter, the necessity is supplied by the other ingredients of the compound. Sand, which is usually recommended, does not appear to be quite the thing needed; something of a penetrable character more in unison with the substance itself, is what is required, and oft-times we may have something at hand which will supply this want—poppy capsules in powder, for instance, will answer well for opium; and, with a view to economy, the residue of ginger, in the preparation of fluid extract or tincture, which by this process is completely exhausted, leaving nothing behind but woody fibre, starch, and other inert matter, may be reserved for mingling with the resins and gum-resins. The idea has sometimes occurred to me that it would not be out of place to prepare for this purpose, as a general resort, fine sawdust, by treating it with alcohol and water to remove all soluble matter—the alcohol used in this treatment being appropriated to some suitable use. Fortunately the substances requiring this sort of management are few.

The conditions, then, on which I conceive depend the success of the displacement process, may be stated to consist, 1st, in the substance being uniformly and finely divided, prepared by contusion, and sifting through sieves ranging in fineness from forty to sixty meshes to the linear inch; 2d, the dampening of the powder without wholly destroying its pulverulent condition; 3rd, the proper packing of this previously dampened powder in the displacement apparatus, which should be firmly done when admissible.

In conclusion, the great advantages of the displacement process, as thus conducted, consist in the facility it affords of obtaining very concentrated solutions of vegetable substances in a comparatively short period of time; by which we are enabled to prepare, at short notice, the various officinal tinctures, syrups, and extracts; and in this latter case it is especially useful on account of the first portions of liquid which pass containing most of the activity of the substance thus treated, which should be reserved for separate evaporation without long exposure to heat and consequent injury.—*Jour. and Trans. Md. Coll. Pharm. March*, 1859.

ON THE CULTURE OF BIXA ORELLANA AND THE PREPARATION OF ANNATTO.

By Th. Peckolt, of Cantagallo.

This neat little tree, which, in the neighborhood of Cantagallo, in Brazil, flowers in December and January, and ripens its fruits towards the latter part of April or in May, grows without attention in most of the provinces of Brazil, and might, with a little care, be made more profitable than many other vegetable products which require cultivation, more attention and labor. For the province of Parâ, the production of annatto is one of its many sources of wealth, though this dyestuff is, by some unscrupulous manufacturers, adulterated, and its price, consequently, has become depressed; Parà is the only Brazilian province where it is cultivated.

For domestic purposes it is much employed here, as well as in the United States and Europe, being used for coloring butter and cheese, and likewise for beautifying and seasoning some dishes; as a medicine it enjoys a somewhat favorable reputation in Brazil, and as a dyestuff, it is almost indispensable.

Notwithstanding the scandalous sophistications, its price in Parà is now from 10 to 12 millreis per arroba (1 millreis = 50 cts.; 1 arroba = 32 Portuguese pounds;) and promises to again rise to its former height of 18 millreis, if the necessary precautions against adulterating it should be taken.

It is a matter of experience that the annatto tree grows luxuriantly in almost any kind of soil, and is, therefore, recommended for the cultivation of such land as is not well fitted for the production of alimentary articles.

The mode of growing this tree is as follows: The land is prepared at the same season and in the same manner as for cotton. The land is furrowed, and at a distance of 8 or 10 feet 2 or 3 seeds are planted, which must have been first soaked in water for some time. After some time, other seeds are planted, when the first ones had not germinated; after three months a weeding takes place, when the superfluous plants are likewise pulled out, not more than one being allowed in one place. Now all the necessary attention has been paid to this tree, with the exception,

perhaps, of another superficial weeding, if the weeds should grow too fast.

The fruit capsules ripen after 8 or 10 months and are collected when they have assumed a reddish color and some are breaking open. The branches with the fruit (*caixos*) are detached from the tree, in consequence of which it bears more without growing high enough to render the collection of the fruit a matter of difficulty. The capsules are spread upon *esteiras* (mats) or cloths, and frequently turned; after thus drying in the sun for 3 or 4 days, they are collected into piles, and beaten or thrashed with clubs, to separate the seeds, which are cleaned from the empty capsules by *ventiladores*, or upon sieves, by shaking and blowing.

To obtain the coloring matter, the following apparatus are in use: A machine, consisting of two upright cylinders, which by means of screws are brought together close enough to crush the seeds, which may be also accomplished by millstones; three large wooden water-tubs, one of which is separated into two parts by boards, an ordinary press, two large copper kettles, several tubs (*gamellas*), &c.

The seeds are kept over night, under water, in one of the large tubs; the second tub is filled with pure water, to have it always convenient and to wash all the implements used. Next morning, small portions of the soaked seeds are taken out, and by two persons well rubbed between their hands and against the sides of the gamellas, a little of the water from the first tub being added once in a while. After the water has become saturated with the coloring matter, it is poured upon a sieve in one of the divisions of the third tub, and then strained into the second division by means of an *urupema* (fine sieve.) The seeds are well rubbed upon the first sieve, and then slightly bruised between the cylinders, after which they are rubbed again in the gamella with some water, expressed with the hands, and strained through the first and afterwards through the second sieve. The strained liquids from the first and second washings are mixed, and, in a large gamella, allowed to settle, which requires about eight hours; the sediment is called *tapiocca de urucù*. The seeds are then again treated in the same way a second and third time between the cylinders, in the gamella and the sieve, and are lastly expressed, to gain all the liquid. When passing through between

the cylinders, the seeds are the third time completely mashed, and the liquids of the second and third washings are immediately introduced in a kettle to evaporate. From the sediment, tapiocca de urucù, the supernatant liquor is decanted and set aside to gain the balance of the coloring matter, which may be still suspended. When the evaporating liquid assumes the consistency of syrup, the tapiocca de urucù is gradually added and the whole stirred constantly. The fire must now be slackened, and regulated with great care, and incessant stirring is essential, until the mass is of the consistence of a thick extract, when the kettle is removed from the fire and allowed to cool. The mass is then taken out in pieces with both hands and thrown into a box lined with banana and palm leaves; each time the hands are rubbed with *ageite de mammono*, impure castor oil, to keep the mass from adhering to the hands.

From the uncultivated Bixa Orellana, common in this neighborhood, I have prepared annatto. From a sparingly bearing tree I collected 16 pounds of capsules, the seeds of which, by three washings, without crushing, yielded 2 pounds of a nice color, which separated from the first washing only in about eight days. The liquor was experimentally evaporated in brass, iron, copper and porcelain vessels to a thick extract and completely dried in the sun. The coloring matter evaporated from the beginning in the sun was the best, the others followed in this order: 2, the product from the porcelain dish; 3, from the brass; 4, from the copper, and 5, from the iron kettle. The quality of annatto from the same port may, therefore, considerably vary, as the manufacturers use any evaporating vessel they may happen to possess. The annatto dried in the sun is easily soluble in water, forming a beautiful orange yellow solution.

Should the culture of coffee near the coast of Brazil become unprofitable, on account of the soil becoming exhausted, annatto might easily become a staple product, and then the process of its preparation would, doubtless, be much improved. Bixa Orellana, as stated before, will grow in almost every soil, with less than half the care and labor to be bestowed on the often failing coffee tree. But then the question would arise, would the consumption increase with an increased supply of annatto?—*Archiv der Pharm.* 1859, *March*, 291—297. J. M. M.

REMARKS ON THE PREPARATION AND APPLICATION OF NATIVE BRANDY, KNOWN UNDER THE NAME OF CATAWBA BRANDY.

By John Zimmerman, of Cincinnati.

In the Proceedings of the American Pharmaceutical Association of 1858, page 379, I observed a report on the application of native wines and Catawba brandy to use in pharmacy, by Fr. Stearns, of Detroit.

Query No. 32.—"Are any of our native wines applicable for use in pharmacy as a menstruum? Are these wines the subject of adulteration? Can the brandy derived from our native wine-growers be substituted for the *Spiritus Vini Gallici* of the Pharmacopœia?" Being referred to the said Fr. Stearns, in the annual meeting held at Philadelphia, 1857, it was answered by this gentleman with much skill. However, I would have been pleased if he had dwelt more on the particulars connected with the manufacturing of said brandy.

The undersigned, having been connected theoretically and practically for many years with the American Wine Establishment of Nicholas Longworth and C. Zimmerman of Cincinnati, has devoted all his attention to the native grape culture, as well as to the manufacture of wine and especially of brandy; and in consequence thereof, has been requested, by several members of your honorable body, to express his opinion about said brandy, as far as his experience would enable him. He therefore begs leave to report to your honorable body as follows:

In 1851, Longworth and Zimmerman proposed to buy, from wine-growers, grapes instead of juice, in order to prevent any possible adulteration. By this operation, two things were gained. First, the pumice of the grape, frequently called the skins or marc of the grape; and secondly, the lees or sediment; the latter being a separated part of the juice, which is produced during the fermentation. These two things forming the most necessary materials for the manufacture of Catawba brandy, can now be bought cheap from the growers.

The best Catawba brandy will be produced if the juice with the pumice are distilled after fermentation,—the extractive matter and the alcohol produced standing in a natural proportion

to each other. But as the juice possesses a high value for wine, and even in the best years produces not more than from eight to ten per cent. of alcohol, brandy manufactured in this manner would reach a price of ten to fifteen dollars per gallon. In order, however, to do anything in this line of business, so important to our country, cheapness of the article in question was to be aimed at.

A trial was made to distil the pumice and lees with the most inferior wines; but this also did not give the desired result; the raw material not producing that quantity of alcohol which the rich extractive matter required. Another difficulty proved to be an obstacle to this way of fabrication: the pumice and lees burning fast to the inner brim of the still and giving thus to the brandy a fragrant taste: an observation made by Professor Wayne, of Cincinnati, a member of the American Pharmaceutical Association, and communicated in the proceedings of that society for 1855.

Further trials were made by mixing pumice, lees, and inferior kinds of wine in a certain manner; to which was added diluted alcohol, in order to gain more alcohol to extract the pumice. This raw material was then distilled by steam in a water-bath, and the result was more satisfactory. However, the brandy was not free of the corn-fusel oil, which remained in consequence of the fabrication of alcohol from whiskey. This lessens the value of the brandy, and is easily discovered by the reagent of L. Molnar, published in the Proceedings of the American Pharmaceutical Association for 1858, page 67.

In order to produce a price-worthy native grape brandy, and entirely free of corn-fusel oil, a great improvement was made by adding to pumice, lees and inferior kind of wines, so much sugar and water, as to produce, by fermentation, alcohol in proportion to the extractive matter; by which process, the pumice also was extracted. This alcohol is identical with that contained in the pumice and lees; and distillation repeated four times proved entirely successful.

The specimen of brandy presented on the occasion of the last meeting of the American Pharmaceutical Association, in September, 1858, was manufactured in the above-mentioned way, and two years old.

American grape brandy, if so manufactured, is equal to French grape brandy when of equal manufacture and age, possessing the same grape oil,—a produce of fermentation, which forms by slow chemical process, œnanthic ether, which must be present in old grape brandy, and in which consists the great value of this brandy.

Imitations of Catawba brandy are frequently offered for sale, a product of diluted alcohol, essential oil made from the pumice of the Catawba grape, and coloring matter. Such an article can be very easily discovered by separating the corn-fusel oil from the alcohol by chemical reagents.

The undersigned, therefore, is firmly convinced that American grape brandy, if manufactured as stated, and allowed to grow old enough, can fully be substituted in the American Pharmacopœia for the "*Spiritus Vini Gallici.*"

If your honorable body takes an interest in these facts, the undersigned would feel highly obliged if his views would be communicated to all local Pharmaceutical Associations.

Restpectfully, JOHN ZIMMERMAN.

Journ. and Trans. Md. Journ. Pharm.

ON MELAMPYRIT.

By WM EICHLER.

In 1835, Hunefeld discovered this saccharine substance in the herb of Melampyrum nemorosum, *L. scrophularineæ.* Its chemical properties have never been investigated.

In order to obtain also the succinic acid, which occurs in considerable quantity in this herb, the author boiled the cut herb with water in a barrel by means of steam, added milk of lime to the expressed liquor until it showed a slight alkaline reaction, evaporated considerably, filtered and washed the residue with hot water; the filtrate was decomposed with muriatic acid and evaporated, when, on cooling, it yielded melampyrin. To the lime residue suspended in water, muriatic acid was added to a slight acid reaction, boiled and filtered, the residue was succinate of lime, and the filtrate yielded some more on neutralization with ammonia and evaporation. The dried salt was mixed with 60 per ct. monohydrate of sulphuric acid and 10 per ct. nitric

acid, and distilled; the sublimed acid was mixed with the distillate, and with the addition of a little nitric acid, evaporated. The yield of succinic acid amounted to 40 per ct. of the succinate of lime.

Scrophularia nodosa *L.*, and Rhinanthus crista galli *L.*, both Scrophularineæ contain also melampyrit.

It appears in crusts consisting of colorless rhombic crystals, without odor, sweeter than lactin when dissolved in water, spec. grav. at 15° C. (59° F.) 1·466, easily soluble in boiling water, requiring at 15° C. 25·5 p. c. water, little soluble in alcohol, acetone, chloroform, wood spirit and acetic ether, insoluble in ether, benzin, turpentine and petroleum, fusible at 186° C. (367° F.) without loss or alteration, not fermentable, without action on polarized light Melampyrit is not altered by dilute sulphuric acid or caustic potassa, it does not reduce oxide of copper or of mercury. Its composition is $C_{12} H_{15} O_3$, differing from mannite by HO, from phycit by O.

If boiled with nitric acid it is converted into mucic and oxalic acids; treated with a mixture of nitric and sulphuric acids, nitrocompounds may be obtained, one of which is an oily liquid, another crystalline, soluble, a third pulverulent, almost insoluble in ether and alcohol. It combines with the alkalies, with baryta, lime, and the oxides of lead and copper; and with concentrated sulphuric acid a compound acid is formed, the baryta and lime salt of which are very soluble gummy substances.

From other saccharine substances it is distinguished:

From *mannite*, by being very little soluble in boiling alcohol, from which mannite crystallizes in a mass of needles.

From *sorbin*, by being less soluble in water, and by sorbin being colored by boiling solution of potassa, and by yielding with nitric acid only oxalic acid.

From *quercit*, by its melting point being at 455° F., by its baryta compound being uncrystallizable, and its yielding only oxalic acid with nitric acid.

From *phycit*—it fuses at 234° F., yields oxalic acid with nitric acid, and a crystallizable baryta salt with its sulphuric acid compound.

From *dulcose*—it loses its 9 per ct. water of crystallization at about 380° F.

From *inosit*—it loses 16·7 per ct. water of crystallization at 212° F., and its solution with tartrate of copper and caustic potassa, changes color on repeated heating.—*Bulletin de la Soc. Imp. des Natur. de Moscou*, 1857.—*Buchner's N. Repert.* vii., 529–543. J. M. M.

THE ALTHEA PAPER A PROPOSED NEW TEST FOR ACIDS AND ALKALIES.

By William E. A. Aiken, Prof. Chem. and Pharm., Univ. of Md.

Among the various medicinal flowers arriving at this port from Germany, there have been of late numerous packages of the dark purple flowers of the so-called Malva arborea. Never having met with any notice of such species of Malva, I was induced on the arrival of the first invoice, to examine the genuine character of the plant, when it became obvious in a moment that the flowers were not the product of any Malva, but of an Althea. In short they proved to be the dark colored variety of our very common cultivated exotic the Althea rosea or Hollyhock. I subsequently found the name Malva arborea occurring as officinal in the Prussian Pharmacopœia, where the proper name Althea rosea is also given as a synonym. Beyond this I can find no authority for imposing a botanically erroneous name on this common plant. The medicinal value of the flower, so far as I can ascertain, seems to be nothing; their use would appear to be limited to manufacturers and dealers in liquors, who find their abundant coloring principle very convenient, enabling them to imitate the tint of a rich old port or a lighter claret effectually and harmlessly. Indeed there would seem to be no tribe of plants from whose flowers the coloring matter could be more safely obtained for internal and habitual use, than from the Malvaceous family.

The beauty and abundance of this coloring principle tempted me to experiment with it as a test color, when I was gratified to find that it formed a very convenient test for acids and alkalies both. And as the plant is in such common cultivation, and so easily obtained independent of any commercial supply, I thought the fact of its availibility for such purpose might possess some interest. The flowers as imported, appear to be carefully se-

lected, are mostly entire, including double calyx and corolla, and exhibit only the dark purple variety of the hollyhock, and it is of these alone I speak. By leaving them for a few minutes in contact with water, a dark bluish purple color is communicated, which is readily imparted to the common white filtering paper. There is a manifest atmospheric agency at work in the final developement of the color, since I have noticed that the slips of paper after immersion in the colored fluid when first brought in contact with the air, exhibit a decided reddish tint that gradually disappears, and gives place to the characteristic bluish or purplish blue tint, which then becomes permanent. This very permanency of the color gives the Althea paper an advantage over the litmus paper, which I have found sometimes rendered quite useless in consequence of the bleaching agency of even diffused light, and the more delicate the tint of the paper, the more danger of such destruction.

I have had the Althea paper exposed for two weeks to the direct action of the sunbeams without any apparent loss of color, and am inclined to believe it will not be affected by any length of exposure to diffused light. Some little care is required in preparing the paper to avoid getting too deep a tint, the lighter shades being much more sensitive. Two drachms of the entire dried flowers when treated with sixteen fluid ounces of cold water, are sufficient to impart the proper depth of color for a sensitive test paper.

Two or three ounces of water should be first poured over the flowers, and after ten minutes infusion the rest of the water added, then by gently pressing the flowers at intervals with a glass-rod, and stirring the liquid for five minutes longer, it will be ready for use. Slips of white filtering paper once immersed, and dried slowly will then answer as a substitute for the litmus and the turmeric paper both, as the Althea paper is made red by acids, and green or rather bluish-green by alkalies, both changes being too decided to be overlooked or mistaken. To approximate the comparative value of the new test color I instituted a comparative trial between the Althea paper, the red litmus, the blue litmus, the grey litmus, and the turmeric papers. Using for this purpose at one time the same alkaline, and at another the same acid liquid for all, and gradually di-

luting both liquids by the continued addition of water, until the coloring matter of the paper ceased to be affected. This contrast showed the Althea paper to be much superior to the turmeric paper, quite equal to the blue and the red Litmus, and although not quite as sensitive as the grey Litmus paper, yet differing in so slight a degree, that for all ordinary purposes it will answer as well.

As there is generally more or less of the colored liquid left after preparing the test paper, I have made it available for experiments on the Lecture-table by adding to every twelve fluid ounces, one fluid ounce of strong sulphuric acid, sp. gr., 1·80. When required for use in place of Tinct. of Litmus, a small bulk can be diluted to the proper shade of color, and then neutralized with a few drops of Aq. Ammon. How long this acidulated infusion will keep unchanged, I am not able to say; have had it on hand three weeks without alteration. In fact it is so readily made, there is but little inducement to prepare it in quantity. If it should be preferred in that form I have no doubt a permanent alcoholic tincture could be made with the coloring principle of the Althea as readily as with that of the Litmus.—*Journ. and Trans. Md. Coll. Pharm, June*, 1859.

WEIGHTS AND MEASURES PROPOSED TO BE USED IN THE NATIONAL PHARMACOPŒIA.

By Mr. P. Squire.

The Government having enacted that the Medical Council shall decide upon *the true Weights and Measures* that are to be used in the Pharmacopœia, it is most important that each system should be well examined before making choice of the one to be used for medicine.

As I have paid some attention to the subject, I will state the conclusions at which I have arrived.

I will begin by mentioning what I think serious objections to the *Avoirdupois system.*

That it was not framed for weighing medicine its lowest division being a drachm, the sixteenth part of an ounce.

That the pound weight does not accord with the pint measure.

The sixteenth part of a pound and the twentieth part of a pint, are the only parts of the system in which the weights and measures agree, *i. e.* an ounce.

The ounce does not contain a whole number of grains, being equal to 437.5 troy grains, and therefore incapable of division without fractions of a grain.

The use of it is discontinued in every country except England and America. Mr. Drinkwater Bethune, one of the commissioners on weights and measures, who reported in 1841, says of it, "that it is difficult to conceive a system more thoroughly well contrived in every part to cause intricacy and confusion."*

In the year 1851, when the last edition of the Dublin Pharmacopœia was published, the avoirdupois weight, for the first time, was tried in medicine, probably on account of the ounce being of the same value as the twentieth part of the imperial pint, and this ounce of 437.5 grains was divided into drachms of 54.7 grains, and scruples of 18.22 grains. New weights were expressly manufactured to include the above fractions; the difficulty of prescribing or of calculating with such weights must be apparent, to say nothing of the different value of weights bearing the same name.

If the committee be induced to adopt the avoirdupois weight, the whole of the dispensing weights throughout England and Scotland must be changed and all prescriptions written and registered prior to the date of adoption must suffer change too, having to be dispensed with weights of another system, and of less value.

The Apothecaries' weight, on the contrary, is divisible into ounces, drachms, scruples, and whole grains; has been used in medicine by civilized nations from time immemorial; France only parted with it when the Metrical system came fully into operation as a national system. It may be seen in the Codex side by side with the gramme and cubic centimetre in the former edition of that work; a very nice way of habituating Pharmaceutists to its value without any risk of confusion or leading to error. The 1 lb. of Holland, and of the German Zollverein, is equal to the half kilogramme, or 500 grammes. Sixteen ounces of our *Apothecaries'* weight is equal to the same thing.

The following table will serve to show with what facilities we

are able to compare our Apothecaries' weights with our Metrical weights:—

APOTHECARIES' WEIGHTS.	THE METRICAL WEIGHTS.	
Ounces.	*Grammes.*	
	Approximate.	*Correct.*
32	1000	995.302
16	500	497.650
8	250	248.825
4	125	124.412
1	31	31.103
One drachm.	4	3.887
15 grains.	1	.972

It must be remembered that 1000 cubic centimetres, or one litre of distilled water, weighs exactly 1000 grammes, or 1 kilogramme.

I propose to introduce the Metrical system into the British Pharmacopœia, side by side with our own formulæ, throughout the work, that we may have the advantage of both, and able to make ourselves fully acquainted with the Metrical system, in case this Government should order its use; giving full tables of explanation and comparison with our own weights. The following gives an example of the Apothecaries' weight and the Imperial measure as found in the London formula, with their respective value in Metrical equivalents, with a separate column to show how it would appear in the Metrical system:—

TINCT. BELLADONNÆ.

TINCTURE OF BELLADONNA.

		Metrical Equivalents.	*Metrical System.*
Take of Dried Belladonna Leaves	4 oz.	125	110
" Proof Spirit,	fluid 40 oz.	1135	1000

I think it would be unwise to alter our present weights and measures, as any alteration would be fraught with inconvenience, and perhaps danger. Since the Metrical system is already in use, in France, Holland, Belgium, Lombardy, Greece, Switzerland, Sardinia, Spain, and the States of South America, and coming into operation in Portugal in 1862, let us keep as we are until we change for *this*, the only Decimal system in existence, the beauty and perfection of which claims for it a preference in every civilized nation.—*London Pharm. Journ., May*, 1859.

ON THE EVAPORATION OF WATER FROM BENEATH AN OILY LIQUID.

By Dr. A. Vogel, Jr.

On evaporating an ethereal tincture containing oil, it is often observed that a stratum of an aqueous liquid is formed underneath, which, on heating the liquid to expel the ether, likewise gradually disappears. This induced the author to make some direct experiments. Water was weighed into a tared beaker-glass, and almond oil carefully poured on the top of it, the weight was again ascertained, the glass tied over with filtering paper, and thus heated daily for about five hours, to between 90° and 100° C. (194° and 212° F.). The diameter of the glass was 35 millimetres, the weight of the water 2,871 grm., of the oil, 10.052 grm. Height of oil ·011 metres.

The following gives the average results of the different weighings: Loss of water after heating for 19 hours to 212° F. 2·007 grm.; evaporation in one hour, .106 grm.; evaporation per hour from one centimetre ·011 grm.

To ascertain whether almond oil alone would alter its weight by long continued heating, a beaker-glass covered with filtering paper was placed in the sand bath, heated as above, from October 9th to November 3d, when its weight had increased ·08 grm., doubtless by oxidation.

Another beaker-glass with water, covered with oil, and tied over with filtering paper, lost during the same time, at ordinary temperature, ·041 grm = ·466 per ct. Evaporation of water from underneath an oily liquid, it will be observed, takes place at ordinary temperatures.—*Buchner's N. Repertorium*, vii. 485–487. J. M. M.

NEW PROCESS FOR DEPRIVING SPIRIT OF FUSEL OIL.

By M. Breton.

This new process is merely an application of a well-known principle, upon which depends the operation by which bromine contained in saline solutions is separated by ether. The spirit containing fusel oil is mixed with a body which is insoluble, or but sparingly soluble, in alcohol, but which can dissolve fusel oil.

For this purpose olive oil is employed. A few drops of this are poured into a bottle with spirit containing fusel oil, which is then shaken, left to settle, and decanted. This process, notwithstanding its simplicity, is not applicable to the treatment of large quantities of spirit or low wines.

The author first made use of a filter consisting of disks of woollen stuff, slightly soaked in oil, and held between two perforated plates of metal. The spirit was deprived of fusel oil, but only until the woollen cloth was saturated with the volatile oil, when it absorbed no more. By means of a current of steam at a pressure of two or three atmospheres, the wool could be readily freed from the volatile oil; but the exposure to steam at this temperature rendered the wool useless for a repetition of the process. The woollen stuff consequently had to be given up, and after many trials it was replaced by a layer of powdered pumice-stone, which acts exactly in the same way as the woollen stuff, but without losing its power of absorption when exposed to a temperature necessary for the volatilization of the fusel oil.—*London Chem. Gaz., April* 15, 1859, *from Moniteur Industriel. Dingler's Polytechn.*

ON THE CAUCASSIAN INSECT POWDER.

By Dr. Noodt.

This insect or flea powder has long been known to the nations of Transcaucassia under the name of "guirila;" it is an important article of commerce in this paradise of vermin, and large quantities are exported to Russia, Germany and France. The coarse powder of a greenish color and a penetrating odor, is the ground flower of Pyrethrum carneum and roseum, growing on the mountains of Caucasus in the neighborhood of Zalki, Karaklis and Dshelal-Oglu, at a height of 5000 to 6000 feet. It is a poison for lice, fleas, bed-bugs, flies, ants, moths, &c., and is invaluable for the military hospitals in hot countries, to keep the maggots off. It is not detrimental to the health of man, merely producing like fresh hay or flowers, some dizziness of the head, if kept in large quantities in closed sleeping apartments. Insects for collection are readily killed by it, and also preserved against

the attacks of other insects; in the same way it may be applied for the preservation of botanical and other collections of natural history. Given internally it does not expel the tape worm, but its concentrated infusion is useful in the form of clysters against ascarides, and injections have done excellent service against maggots in the auditory canal.

It is to be regretted that this powder has been sophisticated. The demand for it having largely increased, the gatherers were unable to supply it, and increased the quantity by grinding with the flowers also the leaves and stems. The powder is rendered still less active by being mixed in Germany and other countries with old stale powder. As it is usually sold in Western Europe, this powder is entirely different in color, odor and activity from the pure Asiatic product, of which, at the bazaar in Tiflis, a pound is paid for with 14 cents, and at the place of production a pud (about 35 lbs) costs 5 silver rubles, = $3.50.—*Kunst & Gewerbebl*, 1858.—*Buchner's N. Repertorium*, vii. 562–564.

J. M. M.

EXAMINATION OF A SPURIOUS ARTICLE OF OPIUM.

By Wm. E. A. Aikin, Prof. Chem. and Pharm., Univ. of Md., and Spec. Exam. of Drugs, &c., for the Port of Baltimore.

I had occasion, quite recently, to examine a package of opium, which, although wholly factitious, was so expertly manufactured, that almost any one—trusting merely to the physical characters, color, smell, taste and general appearances,—and in the absence of any suspicious circumstances—might very well consider it a very excellent article of Smyrna Opium. Suspicion was first excited by the evidences of repacking, in the absence of the Rumex seeds that are found accompanying the genuine article, and further inquiry revealing other suspicious surroundings, it became my duty to determine its morphia value; all opium containing less than 9 per cent. of morphia being prohibited from entry. The result proved that some experienced hand, by using most probably a quantity of spent opium, from which all the morphia had been extracted, had been able to mingle various inert matters with a trifling

per centage of good opium, and yet had been able to preserve most of the physical characteristics of the genuine drug. One hundred grains of the spurious article, dried at a temperature of 212° F., lost 25 grains in weight. The remaining 75 grains —macerated for a few hours in tepid alcohol, carefully triturated, and exhausted, and filtered—left on the filter 58 grains of insoluble matter. This was represented principally by filaments of vegetable structure, which, under the microscope, proved to be the outer skin or epicarp of the poppy capsule, with occasional traces of what appeared to be the fragments of the bruised stem of the plant. The insoluble portion consisted of 40 grains of such vegetable fibre, with 18 grains of gum, caoutchouc, &c.; while 1.10 grs. of morphia and 15.90 grs. of resin, meconic acid, and other matters soluble in alcohol, made up the soluble part. With these data, we can represent the composition of the mass thus :—

Water, ...	25.
Vegetable fibre, principally poppy capsule, .	40.
Gum, caoutchouc, mucus, &c., . . .	18.
Resin, meconic acid, &c., ...	15.90
Morphia, ...	1.10
	100.00

The above expression, though it cannot be offered as the result of a complete analysis, but merely as morphiometrical, is abundantly sufficient to demonstrate the total unfitness of the mass for medical or manufacturing purposes.

The invoice reached this port from one of the West India Islands; and it is not at all unlikely that it may have been offered for entry at some other of our seaports, and, after having been condemned, the consignee has preferred shipping it to the West Indies rather than to leave it in the custom house to be destroyed, if found there at the expiration of six months. In the present instance, the consignee has made the same choice, and the package has been despatched to the British Provinces. As the price of opium ranges quite high at this time, it is not improbable that another attempt will be made to introduce it into the country. And in case of its arrival at any port where no special examiner of drugs is stationed, it would be well if

those who may be casually called upon by the collector to examine such things, could be put upon their guard and induced to scrutinize closely all opium coming from that quarter. That such things have been done, I know from my own experience in one case, occurring several years since, when a quantity of Peruvian bark, condemned at this port, was shipped to the British Provinces, and subsequently sent from thence to one of our southern ports, unprovided with a special examiner, and there admitted to entry.—*Journ. and Trans. Md. Journ. Pharm.*, 1859.

ON INFUSIONS.

By Mr. Stevenson.

We are all practically familiar with the frequent inconvenience experienced in dispensing prescriptions containing the infusions of the Pharmacopœia. The concentrated infusions have been introduced with the view of obviating this inconvenience, but I think the great majority of Pharmaceutists regard their use as eminently unsatisfactory. I have been induced to bring under your notice this evening a plan which we have adopted and practiced for many years, and which, from its extreme simplicity, and the perfect success which has attended it, will, I trust, recommend itself to your favorable consideration.

It has not the merit of originality or novelty, being merely the application in a simple and practical form of the principle on which the familiar essence of beef is prepared, and has indeed already been applied to the preservation of infusions by Mr. Alsop, of London, as described in Mr. Redwood's *Practical Pharmacy*. He recommends the infusions to be filled into bottles with accurately ground stoppers, to be heated until the infusion overflows, then to be closed immediately with the stoppers, which are to be slightly coated with wax, so as to render the bottles perfectly air-tight. I think there are several disadvantages attending this plan, not the least of which must be the uncertainty of obtaining perfectly accurately fitted stoppers—a condition on which the success of the process absolutely depends. Our adaptation of the plan is as follows:—We fill

the infusion, freshly prepared and filtered, into common bottles of any convenient size, up to the bottom of the neck. These are placed in a vessel of water, put on the fire, and allowed to remain until the water has boiled round about them for ten or fifteen minutes. By this time the Infusions will be found to be running over the brims of the bottles. They are then removed one by one, and immediately closed by simply tying a piece of moistened bladder over the top.

We generally prepare as much of each infusion as will last for two or three months; but it will retain for years the fresh taste and aroma of its ingredients. You will find on the table a sample of infusion of senna 2½ years old, infusion of orange 17 months, and chiretta, senega, and calumba about three months.

The advantages of this plan are manifest, and hardly require mention. From its extreme simplicity, any druggist can put it in practice for himself, and can thus always command an infusion the same as freshly prepared, superior to that formed by the concentrated infusion, and not containing any spirit—a matter occasionally of some moment.

Various samples of infusions prepared in the manner stated were submitted to the meeting; some of them had been prepared for a considerable time, and appeared as fresh and good as if recently made.—*London Pharm. Jour. May*, 1859.

ON THE NATURE OF SCAMMONY AND TURPETH RESIN.

By Dr. H. Spirgatis, of Königsburg.

The chemical similarity of the resins of the Jalap roots from Ipomœa jalapa and Convolvulus orizabensis led to the supposition of a similar chemical constitution of the resins obtained from other plants belonging to the family of Convolvulaceæ.*

The genuine scammony used for this analysis was obtained from Trieste, and was in light cakes of a greenish gray color, not transparent, without lustre, of an acrid taste and a peculiar bread-odor, partly soluble in water to a greenish turbid solution,

* The author undertook his analysis in 1853, and Prof. Buchner based on its results his test for the genuineness of scammony. (See Amer. Jour. of Pharm., 1854, page 447.)

in alcohol partly to a clear solution, easily fusible, and burning with a peculiar empyreumatic odor, leaving a white pulverulent residue; it was easily pulverizable to an ash-colored powder.

The pure resin, *scammonin*, was obtained by exhausting scammony by alcohol, evaporating, exhausting the extract with boiling water to remove a volatile acid, redissolving in alcohol, adding water until a precipitate commences to form, treating with animal charcoal, evaporating, dissolving in ether and evaporating. Scammonin is colorless, transparent, affording a white powder, without taste and smell; it softens at 123° C. (253° F.), and melts at 150° (302° F.), it dissolves easily in alcohol, ether, benzol and chloroform. If dissolved in the solution of an alkali or baryta, it is altered and not precipitated on neutralization with an acid, when a peculiar odor, similar to butyric acid, is generated, particularly if the scammonin has not been well purified; the carbonates of alkalies dissolve it on boiling, likewise acetic acid; strong mineral acids decompose it into a brownish, suet-like body, while the liquid contains sugar. The chemical analysis gave results closely corresponding with the elementary analysis of jalapin, in the resin of Convolvulus orizabensis, for which Mayer calculated the formula $C_{68}\ H_{56}\ O_{32}$. Keller's results (see Am. Jour. Ph. 1857, p. 257,) differ very little from them.

The solution of scammonin decomposed by sulphuric acid, afforded a colorless liquid with a peculiar odor. The odorous principle was volatile and distilled over with water, it is probably butyric acid. The residue separated white microscopic needles, which, after purification from ether, separated a white body in granules of a peculiar sassafras odor, and producing a grease spot upon paper; it appears to be identical with the greasy substance from the decomposition of scammonin by acids. The residuary liquid yielded an amorphous, yellowish, resinous mass, soluble in water and alcohol, insoluble in ether, not precipitated by the neutral salts of metallic oxides or alkaline earths; the author calls it *scammonic acid*. The elementary analysis of its baryta salt gave results corresponding with Mayer's analysis of his jalapic acid—3 BaO, $C_{68}\ H_{56}\ O_{32}$.

Scammonic acid, like scammonin, is decomposed by mineral acids into sugar and an acid, which after treating it with animal

charcoal, crystallizes from ether in granules, and having the properties mentioned above. The results of the analysis of this *scammonolic acid* and its baryta salt, are the same as Mayer's for jalapinolic acid, for which he proposed the formula $C_{32} H_{30} O_6$, and for the scammonolate of baryta, $BaO, C_{32} H_{29} O_5$. Mayer found in his jalapinolate of lead 29·95; the author, in his scammonolate of lead, 30·80; F. Keller, in the latter, 33·19 (average) per ct. of lead.

The author has also found the drastic resin obtained from Convolvulus Turpethum, to be a glucoside, and is now investigating it.—*Buchner's N. Repertorium*, vii. 9–20. J. M. M.

FLUID EXTRACT OF VALERIAN.

By Israel J. Graham.

The preparation of Fluid Extract of Valerian has been so frequently referred to, that it may appear almost superfluous to offer anything more upon the subject; on which account it is with considerable reluctance that the writer attempts to bring into notice some views which he has long entertained, respecting the officinal process for making this valuable and extensively used remedy. More than a year since he exhibited, at a meeting of the College, a specimen of the extract prepared without the use of ether, expressing at the same time, his belief, that it could be as efficiently made without its use as with it, but reserved for future consideration a decisive conclusion on this point. The process then adopted has been many times repeated with what success, the sequel will manifest.

The officinal formula directs the Valerian, in coarse powder, to be first treated with a mixture of alcohol and ether, and the solution thus obtained evaporated spontaneously to a given amount, which is then to be mixed with a percolate obtained in the mean time by treating the mass with diluted alcohol. In the evaporation of the first percolate, all the ether and a part of the alcohol is lost, which occasions a waste of material as well as considerable delay. The result is a solution of all that is soluble in the amount of alcohol left after evaporation, with more or less deposit on the sides and bottom of the dish of the oleo-resinous

principle of the root, and, on adding this to the hydro-alcoholic solution, a still further precipitate ensues, a portion only of which is taken up on standing, so that it becomes necessary to agitate the mixture each time it is dispensed, or filter it at the risk of separating a portion of its active principles, which have been disturbed from their native combinations by the manner of treatment.

Circumstances of this nature induced the query in the writer's mind, whether the ether was at all essential in the process, except on account of its ready volatility, and whether the evaporation could not be entirely dispensed with when made of the strength prescribed by the formula.

On examination it will be found that the fluid extract resulting from this process is retained in a menstruum composed of about two parts of alcohol and one part of water, and that consequently, no constituent of the Valerian is held in solution, which this menstruum is not capable of dissolving. It was this fact that first led the writer to depart from the officinal directions in its preparation.

The specimen above referred to was made by treating the finely powdered root, by displacement, with a menstruum of the strength already stated, which was ascertained to completely exhaust the root in the quantity directed by the formula,—in fact, the exhaustion was principally effected by the time a portion of liquid equal to the quantity of root used had passed. With the view of ascertaining, before dispensing the preparation thus made, whether any principle had escaped the hydro-alcoholic treatment, which would be yielded to a mixture of ether and alcohol, and possibly retained in solution in the finished extract, a portion of the residue left in the displacer, after being dried by exposure to the air, was carefully treated with the ether mixture in due proportions, producing a straw colored solution, which, on being spontaneously evaporated, yielded only a portion of fatty matter, having neither the odor nor taste of Valerian, and which is also separated in the officinal process by evaporation and the union of the two liquids. The conclusion arrived at by this experiment was, that the whole of the medicinal properties of the root had been yielded to the first treatment with diluted alcohol. Since that time the writer has continued to

make this preparation without the use of ether, and always with a satisfactory result.

Based upon this plan of treatment and carrying out the views suggested in a paper on fluid extract of buchu, published by the writer in the last number of the Journal, it is now proposed for consideration, to prepare fluid extract of Valerian of double the officinal strength, so that each fluid ounce shall represent one ounce of the root.

The strength of alcohol found best in the writer's hands as a proper solvent for valerian, is made by mixing five parts of commercial 95 per cent. alcohol with three parts of water. In this proportion, a little more of the coloring matter is taken up than when a mixture of two parts to one is used, and, while it does not impair the transparency or permanency of the extract, a richness of appearance is given to it, at the same time the idea is maintained of lessening the alcohol in all such preparations whenever it can be effected without detriment to the result.

The following is the proposed formula and illustrative of the above views:

Fluid Extract of Valerian.

Take of Valerian, in powder, (prepared by passing through a No. 60 seive) . . . . . 16 ounces.
Diluted alcohol, (95 per cent. alcohol, 5 parts, Water, 3 parts,) . . . a sufficient quantity.

Pour on the powder, contained in a dish, sufficient of the menstruum to dampen it, (about 7 fluid ounces) rub it in uniformly by means of the hands, and transfer it immediately to a glass funnel arranged for displacement, pack firmly and evenly, using considerable pressure with the hands,—cover the surface with a piece of perforated filtering paper, pour on a pint or more of the menstruum, and lay over the funnel a piece of oiled silk to prevent evaporation. When fifteen fluid ounces of liquid shall have passed, remove and properly secure it; continue the percolation until eight ounces more pass, or to exhaustion; evaporate this latter portion spontaneously in a warm place, (finishing it in a water bath at a temperature of 180° F.,) until reduced to half a fluid ounce, add to this half a fluid ounce of alcohol to produce a clear solution, filter and mix with the fifteen fluid ounces first obtained.

In the above process, it is essential to success that the Valerian should be in the state of division indicated, and the packing strictly attended to. When these precautions have been observed, the writer has never failed to exhaust the root in the quantity above given, the first portion of the percolate invariably containing nearly or quite all of the active principles; the latter having little of the odor of Valerian, containing mainly coloring matter, is nevertheless *carefully* evaporated to avoid any possible loss.

The advantages gained by this process consist in the production of a highly concentrated solution, with economy of time and menstruum.

Fluid Extract of Valerian prepared in this way is a clear, very rich, dark colored liquid, possessing an intense taste and odor of the root, which it fully represents ounce for ounce. A specimen now on hand, made nearly two months since is entirely free from deposit. The maximum dose is half a fluidrachm. —*Journ. and Trans. Md. College Pharm.*

AMERICAN PHARMACEUTICAL ASSOCIATION.

The Seventh Annual Meeting of the "American Pharmaceutical Association," will be held in the city of Boston, Mass., on Tuesday the 13th day of September next at 3 o'clock P. M.

The objects of the Association and the conditions of membership are explained in the following extracts from the Constitution.

ARTICLE I.

This Association shall be called the American Pharmaceutical Association. Its aim shall be to unite the educated and reputable Pharmaceutists and Druggists of the United States in the following objects:

1st. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.

2d. To establish the relations between druggists, pharmaceutists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.

3d. To improve the science and the art of Pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4th. To regulate the system of apprenticeship and employment so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5th. To suppress empyricism, and as much as possible to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

ARTICLE II.—*Of the Members.*

Section 1. Every pharmaceutist or druggist of good moral and professional standing, whether in business on his own account, retired from business or employed by another, who, after duly considering the objects of the Association and the obligations of this Constitution, is willing to subscribe to them, is eligible to membership.

Section 2. The mode of admission to membership shall be as follows: Any person eligible to membership may apply to any member of the Executive Committee, who shall report his application to the said Committee. If after investigating his claims they shall approve his election, they shall at the earliest time practicable report his name to the Association, and he may be elected by two-thirds of the members present, on ballot. Should an application occur in the recess, the members of the Committee may give their approval in writing, which, if unanimous, and endorsed by the President, shall constitute him a member, and the fact be reported to the Association at the next succeeding meeting.

Section 3. No person shall become a member of this Association until he shall have signed the Constitution, and paid his annual contribution for the current year. All persons who become members shall be considered as permanent members, but may be expelled for improper conduct by a vote of two-thirds of the members present at any annual meeting.

Section 4. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution, and is liable to lose his right of membership by neglecting to pay said contribution for three successive years. Members shall be entitled, on the payment of three dollars, to receive a certificate of membership signed by the President, Vice-President and Secretary, covenanting to return the same to the proper officer on relinquishing their connection with the Association.

Section 5. Every local Pharmaceutical Association shall be entitled to five delegates in the annual meetings, who, if present, become members of the Association, on signing the Constitution, without being balloted for.

JOHN L. KIDWELL, President.

Georgetown, D. C, June 25th, 1859.

Editorial Department.

American Pharmaceutical Association.—On the 13th of September next, at 3 o'clock P. M., at the rooms of the Massachusetts College of Pharmacy, Temple Place, in the city of Boston, the members of the Association will hold their Eighth Annual Meeting; and the well known hospitality of our New England brethren, the time and the place, all promise that it will be large and interesting. But two months and a half remain for the action of committees and investigators who propose to report on that occasion. Rumors of the action of some of these occasionally reach us, which are taken as an earnest of the good fruits to come in autumn. The important subjects of "Weights and Measures," "The Revision of the Pharmacopœia," and "Home Adulterations," will need much careful attention, and we doubt not the several committees are alive to their duties. Every pharmaceutist or druggist, whether a member or not, who has in possession facts relative to adulterated drugs, would materially aid the last committee by communicating them to the chairman, Charles T. Carney, Washington St., Boston. Of the numerous important subjects accepted for investigation by members, we trust a large proportion will be reported on, and thus add permanent value to the Proceedings of the Association. We know of no better discipline to elevate the tone of American Pharmacy than that taking its origin in the pursuit of chemical and pharmacological investigations; they open up subjects of thought which enlarge the mind and benefit others as well as ourselves.

There is a little matter suggested by the Executive Committee, which

is worth calling attention to, in view of lessening the labor of editing the Proceedings. It is that members should be more careful in the preparation of their manuscripts, both as regards the handwriting and the spelling of technical or scientific words, and especially the names of plants, substances, and authors. No words should be left abbreviated unless intended to be so printed. As it is impossible to afford the authors of reports and papers, in many instances, an opportunity to see a proof, it is due to themselves that they present plainly written documents. We also agree with the committee that greater attention to brevity in composition is desirable, so as to prevent the unnecessary extension of the "Proceedings."

Catalogue of the Library of the Philadelphia College of Pharmacy.—It is due to the chairman of the Library Committee, as well as to the editor of this Journal, to state that the Catalogue published in our last issue was, owing to a misunderstanding as to who should read the proof, carried through the press without correction by either member of the committee, which will account for a number of typographical and other errors to be found in it, much to their regret.

Catawba Brandy.—Our readers will observe at page 363, a paper on the mode of manufacturing the best American Brandy, as practised by Zimmerman & Co., of Cincinnati, in a communication to the Maryland College of Pharmacy. From a conversation with the author, we are induced to believe this Brandy stands deservedly high for medicinal purposes, being prepared from the grape by fermentation and distillation.

The American Dispensatory. By John King, M. D., &c. Fifth Edition. Cincinnati, 1859.

Our last issue contained a few general remarks on this book, and since then, at some sacrifice of time, we have glanced over its pages sufficiently to get an idea of its contents. The present title, which is the third, is the same as that of Coxe's Dispensatory, which, for thirty years, was the chief reliance of American apothecaries, until displaced by the work of Wood & Bache. The author claims for the sect he represents the merit of having developed the medical qualities of a large portion of the American Materia Medica, many of which have been in the officinal list of the U. S. Pharmacopœia for nearly thirty years, and were described and figured previouslyby Bigelow & Barton.

Before noticing the work itself, "the Editor of the American Journal of Pharmacy" feels bound to express his regret that Dr. King, under the influence of sore feeling towards the authors of the United States Dispensatory, should so far forget the claims of justice and truth, as to have penned the last sentence of the first paragraph at page xii. of his Preface, a sentence, which, however ingeniously worded, is too transparent to conceal the motive which prompted its expression.

When we state that the first part of the American Dispensatory describes a very large number of our indigenous plants, most foreign drugs in use in regular practice, besides a large number of non-metallic and metallic mineral substances, the reader will understand its voluminous character.

The merit of this portion of the book, as a work for general reference, is considerable. The descriptions of indigenous plants are chiefly from Gray or Wood, the author having apparently given himself little trouble in investigating botanical authorities, or by actual observation. The history and properties of drugs are generally described in plain, untechnical language, well suited to a large number of those to whom the book is addressed. The reader will be struck with the sparseness of chemical observations in reference to our indigenous plants. Nearly all that are quoted by Dr. King have been the work of Graduates of the Philadelphia College of Pharmacy during the past thirty years. Although every year adds some light on this subject, and the transactions of the American Pharmaceutical Association are taking this direction, yet it is time that the "Eclectics" themselves should aid in the work. So far they have expended their exertions in getting up "concentrated preparations" and "resinoids," which, in but few instances, have any claim to be considered pure proximate principles. Dr. King has relied chiefly on Pereira and Christison as authorities in describing the foreign Materia Medica, and Darby's edition of Wittstein's Pharmaceutical Chemistry has proved a perfect god-send in the line of rationales in chemical processes. Among the journals we observe that the American Journal of Pharmacy and the Pharmaceutical Journal have contributed largely to his aid. With unlimited space for quotations, and with considerable ingenuity in working up contributions from various sources, Dr. King has made a very readable book, embracing a wide range of information; but viewed as a scientific work of reference for investigators on the Materia Medica, its inaccuracies are so numerous, and its patch-work character so unmistakable, that it will have no scientific authority, except so far as each individual quotation is concerned.

We have already alluded to the want of homogeneousness in the composition of the work. This will be particularly noted at the article Cinchona, which occupies sixty-six pages, and which is attributed, by the author, to Prof. E. S. Wayne. On looking closely into this chapter, it will be found to consist chiefly of copious, well selected extracts from Weddell, Howard, Pereira, Winckler, Pasteur, Leers, Riegel, and others, which are thrown together as though they were intended to be employed in elaborating an article on the subject. If we may hazard an opinion in regard to the matter, it is that Mr. Wayne so intended his paper, whereas Dr. King has published it in extenso. In no other way can we account for the devotion of sixty-four pages to the botanical, commercial and chemical history of a single drug, Cinchona, the latter carried out to the minutest details.

The therapeutical portions of the articles contain many that may be called eclectic ideas. There is no doubt that a large number of practition-

ers are using "Eclectic medicines" in a way peculiar to their sect. The old war-cry of the botanic doctors was the abuse of mercury, and the more refined Eclectics, though they do not keep up the cry against minerals, still repudiate mercury, antimony and arsenic, and busily seek among our native plants, agents capable of substituting the compounds of these potent metals, as cathartics, colagogues, emetics, alteratives; and in Leptandra, Podophyllum, Lobelia, Apocynum, etc., believe they have found them. The physician may find many useful hints in the "American Dispensatory," in regard to the medical uses of these plants, the result of the rude experience of unprofessional observers, as well as of graduates of the "Eclectic" Schools.

Among the plants which have attracted most attention we may name the following, attaching an asterisk to each of those which are particularly relied on in their practice, viz:

Aletris farinosa.
Ambrosia trifida.
*Apocynum cannabinum.
Asclepias incarnata.
*Asclepias tuberosa.
*Baptisia tinctoria.
*Caulophyllum thalictroides.
Chelone glabra.
*Cimicifuga racemosa.
Coralorhiza odontorhiza.
Corydalis formosa.
*Cypripedium pubescens.
*Dioscorea villosa.
*Epigea repens.
Erechthites hieracifolius.
*Euonymus atropurpureus.
*Eupatorium purpureum.
*Geranium maculatum.
Helianthemum canadense.
*Hydrastis canadensis.
*Iris versicolor.
Kalmia latifolia.
*Leptandra virginica.
*Lobelia inflata.
*Myrica cerifera.
*Phytolacca decandra.
*Podophyllum peltatum.
Ptelea trifoliata.
*Sanguinaria canadense.
*Scutellaria lateriflora.
*Senecio aureus.
*Stillingia sylvatica.
*Viburnum opulus.
*Xanthoxylum fraxineum.

In glancing over the pages, we find that errors have crept in which should be noted and corrected; for instance, in describing the properties of Aralia spinosa, the bark of Xanthoxylum Carolinense, has been confounded with it—known among the Eclectics under the name of Southern prickly ash. At page 175, Tous les Mois is said to be very soluble in water—when it should be boiling water. At page 186, "Ethereal Oil of Capsicum" is said to become "filled with crystals of *Capsicin* of curious dendroid forms." These "crystals" are really the solid fatty oil which separates. (See ante 185.) At page 241 it is stated that the Dutch government has introduced Cinchona into "Japan," when it should read "Java," etc., etc.

One of the peculiarities of the Eclectics, found among the Materia Medica, and a feature upon which they take much credit to themselves, is the class of "Resinoids," or "principles," as they are called, of which Cimicifugin, Podophyllin and Leptandrin are types, and the manner of making some of them is so peculiar, that we quote the following:

"*Caulophyllin.*—Extract the root of Caulophyllum, and obtain a thick fluid extract, in the same manner as recommended for obtaining Podophyllin [by means of alcohol], the product is added to twice its volume of a saturated solution of alum, and placed aside to rest for three or four days; then place it on a filter cloth, and allow the water to filter through;

wash the product two or three times with fresh water and let the residuum dry in the open air; when dry, it readily forms a powder of a light gray color."

Made by another process, under the head of "Chemical Properties," the author remarks, "Caulophyllin, thus prepared, is a resinous substance, of a light brown color, with a peculiar, not unpleasant odor, slightly bitter taste, with some pungency. Its chemical reactions have not been *thoroughly investigated;* it appears, however, to be a neutral substance, like salicin, *exhibiting neither acid or alkaline principles.*" Such is a fair sample of Eclectic organic chemistry.

Cimicifugin is the resinous precipitate obtained by precipitating a syrupy alcoholic extract of Cimicifuga, by pouring it into water, washed, dried and powdered, and is one of the most highly esteemed Eclectic medicines, and spoken of as an active principle.

Dioscorein is prepared like Cimicifugin, from the root of Dioscorea villosa, and is considered a powerful anti-spasmodic and *a specific in bilious colic.*

Eupurpurin is the substance obtained when Eupatorium purpureum is treated as in making Cimicifugin.

As a sample of the looseness and empyrical character of some of these so-called "principles," we extract the following, viz:

"*Geraniin.* Geraniin is obtained by making a saturated tincture of the root of Geranium maculatum, filtering, distilling off a part of the alcohol, adding water to the rest, and evaporating to dryness. The operation is similar to that for Podophyllin. Many manufacturers prefer making it by evaporating an aqueous decoction of the root to dryness and *evaporating.*"

We should like to see the result obtained by evaporating a dry extract. the preparation is nothing, so far as we can make out, but an extract of Geranium. Why not call it by its right name?

Besides the above, and obtained in a manner analogous to Cimicifugin, are Iridin, Leptandrin, Podophyllin, Ptelein, etc. Of the whole list, the only one that is crystalline is Hydrastin. The rest being mixtures of resin and apothem, resin and volatile oil, resin and fixed oils, or mere extracts. Dr. King defends the practice of giving names to these mixtures, which really indicate to those unacquainted with Eclectic literature that they are distinct organic principles. We believe, from the indefinite manner in which many of his processes are given by the originators of these preparations, that it would puzzle any but an Eclectic to produce similar results, and we fear that in his anxiety to give formulæ, he has been imposed upon by some of the manufacturers, whose processes are very Brahminical.

Part second of Dr. King's book is entitled "Pharmacy," and includes the general principles of the art of preparing medicines, and a detailed account of most of the preparations, regular and irregular, used by Eclectics and physicians. The chapter on the collection and preservation o

plants is judiciously drawn up. That on specific gravity is an improvement on the previous edition.

The subject of weight and measures, though illustrated in the appendix with tables, is but slightly dwelt upon in the preliminary chapter; and in the body of the formulary, the author is full of inconsistencies arising from inattention to this subject in giving the recipes of foreign Pharmacopœias. The reader in this department will be struck with the absence of the formulæ of the U. S. Pharmacopœia. Whether the author, in carefully avoiding the U. S. Dispensatory, has felt disposed to ignore the Pharmacopœia also, we do not know, but he has undoubtedly seriously injured his book in view of its use by apothecaries and physicians, by substituting formula from heterogeneous sources, where other systems of weights and measures are used. We can only attribute this course to the inconvenience of writing a commentary on the U. S. Pharmacopœia without resorting to the U. S. Dispensatory. The general arrangement of the classes of preparations is similar to that in the latter work. The processes of maceration and percolation are both directed in extraction, and C. A. Smith's idea of vapor percolation is repeatedly recommended in making extracts. Being unbound by any authority in regard to formulæ, the author has used the utmost license in selecting and naming preparations.

Among the Vinegars, Acetum Lobeliæ and Acetum Sanguinariæ are found, made from the seed and root respectively, two ounces to the pint.

Under the Ethers: The Edinburgh formula for sweet spirit of nitre is adopted; sulphuric ether is not recommended for inhalation, nor is any allusion made to the discovery of Anæsthesia in connection with it, the preference being given to chloroform, which is described among the Materia Medica. Under the head "Cataplasma," those of carrots, lobelia, cranberries, and poke root are described, the latter made by roasting the recent roots in hot ashes until soft, and then mashed till of the right consistence. *Decoctions* as a class of preparations are abandoned, general directions for their preparation being given. The class *Enemata* contains several peculiar to the Eclectics, as *Enema Cimicifugæ composita Lobeliæ comp., Xanthoxyli, &c.* The extracts and fluid extracts are quite numerous. Preliminary directions are given for each variety of extracts. Under watery extracts it is advised that "the substance be not too finely divided, in order to avoid the extraction of inert principles." (!) It is also recommended in the general directions to evaporate aqueous solutions at a low temperature, and *not to stir* them, so as to avoid the action of the air upon them; yet extract of taraxacum is directed to be constantly agitated during that process! Want of care in expression is of frequent occurrence: for instance, under *Extractum Aconiti Alcoholicum*, the author says extract Aconite leaves *or* Aconite roots with diluted alcohol and evaporate, &c., and then "this is the only extract of Aconite which should be used;" query? that of the leaves or roots? Again the formula for extract of colocynth directs three pounds of colocynth deprived of the seeds to be macerated in five pints of

diluted alcohol, &c., and attributes it to the London Pharm., when that authority directs water as the menstruum. And of this alcoholic extract he says the dose is from 5 to 30 grains, whilst at the article Colocynth, at page 357, he says the dose of that substance or its aqueous extract is from 4 to 10 grains, and of the alcoholic extract 1 to 4 grains! Among the extracts described there are many from plants rarely used, except by the Eclectics, as Baptisia, Caulophyllum, Cypripedium, Hydrastis, Leptandra, Phytolacca, Ptelea, Scutellaria, &c., which are all hydroalcoholic.

The general directions for preparing fluid extracts are written by William S. Merrill, and are as follows, viz: For each pound of the substance or ingredients to be treated, four pints of alcohol, 76 per cent., four ounces of sugar and a sufficient quantity of water are taken. The substance suitably communited is digested in part of the alcohol for 24 hours at a gentle heat, then displaced with the rest of the alcohol, reserving four fluid ounces of the strongest liquid and evaporating the remainder of the tincture to four fluid ounces. The dregs in the displacer are then exhausted with hot water, the infusion evaporated to 8 fluid ounces, the sugar dissolved in this, and after again evaporating to half a pint, the syrupy liquid is mixed with the reserved tinctures.

This is a good general direction for ordinary operations. Among the peculiar fluid extracts is the following by Mr. Merrill of Cincinnati.

"Extractum Rhei et Potassæ Fluidum. Fluid Neutralizing Extract. *Preparation.* Take of India Rhubarb and Bicarbonate of Potassa, of each *two pounds Av.;* Cinnamon and Golden Seal, [Hydrastis] of each *one pound;* Good French Brandy, *one gallon;* Oil of Peppermint, *one fluidrachm;* Refined Sugar, *three pounds.* Water a sufficient quantity. Grind or coarsely bruise the Rhubarb, Cassia and Golden Seal and mix them, macerate for 24 hours or longer in the brandy, express the tincture with strong pressure, and add to it the oil of peppermint dissolved in a little alcohol. Break up the residue from the press, place it in a percolator and gradually add warm water until the strength of the articles is exhausted. Evaporate this solution to four pints, and while the liquor is still hot dissolve in it the Bicarbonate of Potassa and Refined Sugar, and continue the evaporation, if necessary, until, when added to the tincture first obtained, it will make one gallon and a half of fluid extract."

This preparation is used as an aperient antacid, like the compound powder of rhubarb. The preparations of iron are mostly described, and among them Dr. Sanders' Ferri et *Salicineæ* tartras and Ferri et Morphiæ tartras —two very indefinite compounds—will be found. Under the head "Lactinated Preparations," there is a class of powders consisting of active medicines diluted with lactin. Under the several heads of *Linimenta, Liquores, Lotiones* and *Mistura*, numerous Eclectic preparations are brought forward, many of them well adapted for the purposes intended, and eligibly compounded, and some *very* peculiar; among these we may enumerate the following:

"Linimentum Caoutchouci. *Caoutchouc Liniment. Preparation.*—Take of Caoutchouc, in fine pieces, *a convenient quantity*, Oil of Origanum, *a sufficient quantity.* Dissolve the caoutchouc in the oil. Paper saturated with this liniment is applied as a stimulant.

Linimentum Succini compositum. *Preparation.*—Take of oil of Stillingiæ (an alcoholic oleo-resinous extract), rectified oil of Amber, each a fluid ounce. Oil of Lobelia (ethereal extract) three fluid drachms; olive oil two fluid ounces. Mix together."

This preparation is used in "chronic asthma, croup, cholera, epilepsy, sciatica," and other spasmodic affections, and is said to act efficiently.

"Lotio Hydrastis composita. *Preparation.*—Take of strong decoctions of Green Tea, and Golden Seal, [Hydrastis] each *one pint;* Sulphate of Zinc, Gunpowder, dried Sulphate of Iron, each two drachms. Mix the two decoctions, add the remainder of the articles and agitate briskly. After solution and decomposition have ceased, decant the supernatant liquid."

Used "as a collyrium in chronic ophthalmic diseases," and "in all chronic diseases of mucous surfaces."

"*Mistura Chenopodii composita. Preparation.*—Take of Castor oil, *one fluid ounce;* Wormseed oil, Anise oil and Tincture of Myrrh, of each *a fluidrachm. Mix.* This is pronounced to be an excellent vermifuge, resembling Fahnestock's, which the author says is said to be composed of "Castor oil, *one fluid ounce;* oil of Wormseed, *one fluid ounce;* oil of Anise, *half a fluid ounce;* Tincture of Myrrh, half a fluidrachm; oil of Turpentine, 10 minims; Croton oil, one minim. Mix. Dose a teaspoonful for an adult every 2 hours, to be continued for ten or twelve hours."

As a result of ignoring the U. S. Pharmacopœia, the author has supplanted the beautiful officinal process of Dr. Staples, for Morphia, by that of the Dublin Pharmacopœia, after Gregory and Robertson.

The chapters on pills, powders and syrups, embrace many compounds peculiar to the Eclectics. Among the syrups, that for Wild Cherry Bark is made by digesting 5 oz. of the coarsely powdered bark (contained in a muslin bag) in Oj. of hot simple syrup, for twenty-four hours, when it is expressed and strained.

The chapters on quinia, soda and strychnia are sufficiently full. Among the preparations of quinia are Tartrate of Quinia and Tartrate of Quinia and *Salicin.* (!) At page 200, our author admits Salicin to be, as it undoubtedly is, a neutral principle—as well might we call Syrup of Citrate of Iron a solution of *Ferri et Sacchari Citras.*

In the general remarks on Tinctures, the author, at page 1292, ventures the opinion that "If all tinctures were prepared and dispensed, not according to the amount of drug exhausted in them, but according to the sp. grav. of the solvent employed in making them, and the density of the resulting tinctures, there would be more uniformity of strength among this class of preparations than at present, and by means of a hydrometer every druggist could keep his tinctures of the officinal strength." To prove how erroneous this conclusion is, it is only necessary to remind Dr. King that the medical value of drugs, as opium, barks podophyllum, etc., depends on the per centage of their active principles, and that many of

these bear no uniform proportion to the amount of matter soluble in the diluted alcohol that they contain.

The ointments and wines embrace nothing on which to remark.

Part 3d of the Dispensatory is chiefly occupied with "obsolescent or objectionable medicines," which include "those minerals which have for many years past been the principal medicinal agents used by medical men, but which, in consequence of the great uncertainty of their action, and the permanently deleterious effects they produce in the system, are going rapidly out of use, being at the present day employed by very few of the liberal and investigating members of the profession." Under this plausible heading Dr. King proceeds to describe the chemical and medical properties of the compounds of antimony, silver, arsenic, barium, cadmium, copper, mercury, nickel, platinum, lead and zinc, thus placing the forbidden fruit within reach of his Eclectic brethren, to tempt them to sin. He should have recollected the words of the poet:—

"Vice is a monster of such hideous mein,
That to be hated needs but to be seen;
But seen too oft, familiar with her face,
We first endure, then pity, then embrace."

If the progress made by the Eclectics, in the adoption of mineral preparations in their practice, is as rapid for the future as it has been during the past, we shall not be astonished to find that some Eclectic savan will discover the means of depriving those terrible bugbears, "mercury, antimony and arsenic," of their medicinal danger, and adopt them into practice as safe and eligible.

We must not, before concluding, forget to concede to the publishers due credit for the neat and substantial manner in which the work is printed and bound.

The Microscopist's Companion; a popular Manual of Practical Microscopy. Designed for those engaged in microscopic investigation, schools, seminaries, colleges, etc., and comprising selections from the best writers on the microscope, relative to its use, mode of management, preservation of objects, etc., to which is added a Glossary of the principal terms used in microscopical science. By JOHN KING, M. D. Illustrated with 114 cuts. Cincinnati, ROBERT CLARKE & Co., 1859. 308 pp. octavo.

In these days, when even children are supplied with microscopes to indulge curiosity, it is not surprising that the more advanced should feel an interest in getting a glance at that interesting portion of existence, which the structure of our eyes preclude us from recognizing unaided by the lens. To meet this interest, for several years past the manufacture of microscopes has been greatly extended, and they may now be had of all qualities to suit every variety of demand. These instruments are often much less valuable to amateur students, from a want of understanding the principles involved in their construction and mode of action; and of knowing how to use them and keep them in order. The "Microscopist's Com-

panion" is just the work to give this information to the beginner, whilst it also embraces a description of all the higher grades of microscopes, well illustrated by figures, and enters into those minutiæ of manipulations practised by the best microscopists in physiological and chemical research. There are chapters on the mounting and preservation of objects, the manner of conducting investigations into the nature of organic structure, living and dead, and into the characters of urinary and vesicular deposits, so important to the physician. The *Glossary* appended to the book will be found useful in understanding micrographical papers, and descriptions of instruments. On the whole, we believe the work to be a compilation of much that is valuable to amateurs and students from the best writers on the subject, besides much practical information in reference to the purchase of instruments, their prices, and the names of those manufacturers in this country and Europe, noted for the good quality of their workmanship.

What may be learned from a Tree. By HARLAND COULTAS, Author of "Organic Life the same in Animals as in Plants," etc.

We are indebted to the author for sending us some time ago, parts first and second of this work, and we have just now received part third. The former were read with considerable interest, and as soon as opportunity offers, we hope to derive pleasure and instruction from following the author through chapter vii., in which he brings forward some new views in regard to the developement of leaves, and chapter viii. a sketch of the geological records of primæval botany. Mr. Coultas certainly has the true enthusiasm of a student of nature, and after setting forth the numerous beauties, harmonies and adaptabilities of vegetable life as exhibited in the tree, he uses them in illustration of his views of political and social economy—aiming to benefit as well as interest his readers. We hope the author will receive substantial encouragement to continue his work to completion. It is issued, for convenience, in a serial form, at twenty-five cents the number of 48 pages. For sale by John Alexander, 52 South Fourth Street, Philadelphia.

DEATH OF HUMBOLDT.

The recent notices of the gradual decline of this illustrious European philosopher have prepared the public for the intelligence of his decease, which is announced as having taken place in Berlin on the 6th of May. Had he lived but a few days more than four months longer he would have completed the ninetieth year of his age. His fame belonged not only to Europe, but to the world, and in this country especially, probably no man who was known to us only through the medium of his scientific writings was held in equal reverence and admiration. The simple record of his life forms the noblest monument to his memory. We need only gather up the successive facts in his career to show that the "man of the century" has been taken from the world.

Freidrich Heinrich Alexander von Humboldt was born in Berlin, Sept. 14, 1769. His father, who was a man of military and civil distinction in Prussia, died when his son was but ten years old, but the latter still enjoyed the advan-

tage of a singularly careful education. He studied at Frankfort-on-the-Oder, at Berlin, and at Göttingen, devoting himself chiefly to the natural sciences, to the Greek language, and to the application of science to the practical arts. Among his early instructors in the former were Blumenbach, Beckmann, and Lichtenberg. His university studies were varied by excursions to the Hartz Mountains, and to the vicinity of the Rhine, which occasioned the first-fruits of his literary labors, in a work entitled, "The Basalt on the Rhine" (1790).

In the Spring and Summer of that year, accompanied by one or two congenial friends, he made a tour through Belgium, Holland, England, and France. The acquaintance of Sir Joseph Banks, and the enthusiasm of one his companions, who had made a voyage to the South Sea, awakened the desire for visiting tropical regions, and gave a coloring to his future life. On his return from England, he passed some time at a commercial academy in Hamburg, with a view of engaging in the pursuits of trade. But his inclinations strongly tended to the cultivation of physical science, and in 1791, he repaired to the School of Mines at Freiberg, where he received private lessons from the celebrated Werner, and enjoyed the friendship of Leopold von Buch, Freiesleben, and Del Rio. His researches in this locality led to the preparation of a treatise on the fossil botany of Freiberg, which was published a year or two later (1793.) A larger work on the physiology of the nerves and muscles (1797-99) attests the predominant tendency of his mind.

The death of his mother in 1796 removed one of the obstacles to his cherished purpose of a grand scientific expedition to the tropics. After pursuing an extensive course of study in the application of astronomy to geography, and engaging in meteorological observations with Von Buch, he went to Paris, where he first made the acquaintance of Bonpland, with whom he passed the Winter of 1798 in Madrid. This was, in fact, the turning point of his life. Such a favorable impression did he make on the Spanish authorities, that he received permission to visit at pleasure any of the Spanish possessions in America or the Indian Ocean, with a guaranty of the free use of his astronomical instruments, and of no restraint in the collection of specimens in natural science.

In June, 1799, he embarked, in company with Bonpland, for South America, and arrived at Cumana in the middle of July. The next eighteen months were spent in an exploring tour through Venezuela; and in February they left the sea-coast for the south, with a view of reaching the river Apure and the Orinoco. They passed over the cataracts of Atures and Maypures in Indian canoes to Fort San Carlos on Rio Negro, about two degrees from the equator, and after a weary journey through the wilderness, returned to the Orinoco, of which they made the first exact scientific observation. From Cumana, at which they arrived in safety after their perilous excursion, they sailed to Havana, where they remained several months. They next went to Bogota, the vicinity of which they carefully explored, and in September, 1801, continued their journey to the South, arriving in Quito, Jan. 6, 1802. Here they remained until the following June, pursuing their researches in the volcanic region, and ascending to heights which had never before been trodden by the foot of man. On June 23, 1802, they reach a height of 19,230 feet on the Chimborazo, which was more than 3,000 feet higher than the point attained by La Condamine in 1738. Here they planted their instruments upon a narrow ledge of rock which projected from the vast field of unfathomed snow. A broad impassable chasm prevented their further advance; they were enveloped in thick fogs, and in an atmosphere of the most piercing cold; they breathed with difficulty, and blood burst from their eyes and lips. Only once has this elevation on the Chimborazo been surpassed, when Boussingault, in 1831, attained a summit of 19,600 feet, by a different path from that chosen by Humboldt.

Crossing the passes of the Andes, the travellers pursued their way to the upper valley of the Amazon, and made a thorough exploration of that portion of Peru. In December, they sailed from Gallo to Guayaquil, and after a second tedious voyage, arrived at Acapulco, March 23, 1803. Thence, they proceeded

to Mexico, where they remained for several months, pursuing their researches in the volcanic regions, and making rich and valuable collections in natural history. In March, 1804, after exploring numerous localities on the Mexican coast, Humboldt sailed to Havana, where he remained for two months, gathering and arranging the materials for his "Political Essay on Cuba" (Paris, 1826). He next directed his attention to the United States, and accompanied by Bonpland, visited Philadelphia and Washington, where he was treated with distinguished attention by President Jefferson, and after a brief sojourn, sailed for Bordeaux in July, 1804.

He now took up his temporary abode in Paris, where, in connection with Gay-Lussac, he devoted himself to chemical researches, chiefly on the composition of the atmosphere, until the following March. After a journey to Italy, he returned to Berlin in December, 1805. In 1807 he accompanied Prince William of Prussia on a political mission to France, and with a view to the publication of his works, made Paris his residence until 1827. The first portion of his great work, "Voyage to the Equinoctial Regions of the New Continent," was published in Paris in 1809. In the Winter of 1827 he delivered a course of lectures in Berlin on the "Cosmos," which were the foundation of his celebrated work of that name.

In 1829, Humboldt was commissioned by the Emperor Nicholas to make an expedition to the Altai and Ural Mountains, with a view to examining the mineral treasures of those regions. The tour extended through Moscow, Kasan, Tobolsk, and Barnaul to the Chinese frontier. He was accompanied by his two friends, Ehrenberg and Gustav Rose. The journey, which occupied nine months, is described in "Central Asia" (Paris, 1843). This journey furnished the most valuable contributions to the science of physical geography. New light was thrown on the volcanic agencies in Central Asia: many important facts were set forth on the soil, climate, and connection of the mountain chains; and owing to the interest which it awakened, a regular system of observations was established by the Imperial Academy of St. Petersburg, throughout the Russian Empire, for the purpose of noting the changes in meteorolgical phenomena.

The political movements of 1830 gave the activity of Humboldt a political direction to a certain extent, but without diverting his attention from the pursuits of science. In May, he attended the Crown Prince of Prussia to the last Diet of Warsaw, and soon after was with the King at Teplitz; and on the accession of Louis Philippe, was commissioned by Frederic William III. to acknowledge the new dynasty at Paris, and to forward political intelligence from that capital to Berlin. He received many similar commissions within the course of the next twelve years, which required him to spend a considerable portion of his time in Paris.

Since 1842, Humboldt has resided at Berlin, engaged in the preparation of "Cosmos," which sums up the observations of a long life on what may be termed the "Harmonies of the Universe," receiving visits from strangers of every nation, who were attracted by his scientific fame, carrying on an extensive correspondence with men of learning in various departments of research, and cherishing the curiosity of youth with regard to every new discovery and phenomenon in the realms of nature.

Humboldt was remarkable for combining the fruits of his own observations with the exhibition of whatever had been accomplished by other investigators in the field of physical inquiry. In this comprehensive department he was equally eminent as an explorer and a historian. As he detected every phenomenon with wonderful sagacity, so he recorded every discovery with unparalleled fidelity. This is not the place to give an account of his contributions to science. His positive additions to the treasures of human knowledge would fill many volumes. But what will ever distinguish Humboldt from the mass of physical inquirers who had preceded him, is his study of the universe as a harmonious whole, and his search for the laws of order, beauty, and majesty beneath the apparent confusion and contradictions of isolated appearances.—*N. Y. Tribune.*